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CAROTID ANEURISMATA IN A HORSE.

BY JOHN HENRY STEEL, F.R.C.V.S.

THE patient was a fat grey Arab (Gulf), aged, nearly fifteen hands in height, used for harness purposes, entire, the property of a native gentleman of Bombay. Admitted for swelling underneath the collar on the off-side. This proved to be of some standing, firm under pressure, either deep-seated in the levator humeri or underneath it; pressure caused some flinching, and the firm mass was about the size of a goose's egg. The practical class of the Bombay Veterinary College was instructed that this might be one of those cases of tumour in the substance of the levator muscle which had been recently described at length in a valuable paper in the VETERINARY JOURNAL, and which generally are thick-walled abscesses, the result of long-continued collar pressure, or simple fibromata due to the same cause. It might, on the other hand, be similar to the tumour in a working bullock operated on by me at Secunderabad, which animal died under operation for removal of the growth, a carotid aneurism. In favour of the former view was the greater frequency of levator humeri tumours than carotid aneurisms; in favour of the latter was the depth of the tumour, and its deeper part certainly being interior to the inner surface of the muscle. The growth was inclined to increase in size, and the owner wished it removed; blisters had proved ineffectual for procuring its absorption. An operation was decided on, firstly, for diagnostic purposes, and, in view of the possibility of aneurism, with the greatest caution; secondly, for removal of the tumour if fibrous, or for opening it up thoroughly if only an abscess. The operation to comprise—(1) placing the animal under chloroform; (2) the exploratory incision after puncture with a small trocar; (3) such measures as might be decided on when the diagnosis was

complete. Anæsthesia was induced in the ordinary way, then an incision was made through the skin longitudinally over the tumour from before backwards, giving ample room for future proceedings. A similar incision was next made on to the tumour through the levator muscle and parallel with its fibres, but as the reflex contraction of the fibres caused them to firmly grasp the knife by becoming tense, this proved of little use, and ultimately I had to divide the fibres transversely for about two inches. The superficial fibres were normal, the deeper white and atrophied (the result of inflammation), and gradually fused with the dense wall of the tumour. Puncture with the trocar now proved ineffectual for drawing off any contents, so a small exploratory incision was made, and the tumour found to consist of a firm fibrous wall and yellow solid lymphy contents. These latter proved to be readily separable from the wall by insertion of a finger through the orifice, and were evidently a long-standing clot, connected with a similar plug of the carotid. It was manifestly injudicious to remove the tumour, therefore a small amount of the coagulum was taken away, the wound well dressed with carbolic oil and filled with a pad of medicated tow, and the animal allowed to rise. The parts healed in due course, and the tumour was smaller, but just at the last stage of cicatrisation one morning the patient was reported as manifesting tetanic symptoms, the tail being raised, the bowels confined, and the haw protruded. These symptoms having been verified, a full dose of physic was given, and they subsided in a day or two. However, we were not able to make a good case out of it, for when just about to discharge the animal (to be worked with deeply chambered collar) we found a fresh aneurism had appeared on the near side of the neck, exactly symmetrical with that on the off-side. Patient was discharged as permanently unfit for harness, and liable to fall dead at any time.

ANTHRAX IN SHEEP.

BY EDWARD STANLEY, F.R.C.V.S., GOVERNMENT VETERINARY SURGEON, SYDNEY, NEW SOUTH WALES.

In accordance with instructions from the Under Secretary for Mines, Sydney, New South Wales, on August 9th, I proceeded to Bourke, to investigate a sudden fatality in a mob of sheep, and submitted the following report subsequently:—

It appears that Mr. Hurtle Fisher purchased a mob of 12,000 ewes in lamb, from Nelyambo; and, owing to the flooded state of the country, had to rent a paddock on Jandra Station, near the Cobar Road. After remaining there for four months, during

which time most of the ewes lambed, they commenced the journey with 9,000 lambs, via Bourke, in order to cross the Darling River to Nee Nee Station, Queensland—Mr. C. Gould, drover, in charge.

On the afternoon of the fifth day some of the leading sheep began to lag behind, looked ill, staggered about, and quickly died. The mob went on to the camp named Stone Quarry Reserve, and next morning 800 were dead.

The ewes were old and low in condition; the lambs were vigorous, well-grown, and healthy. About fifteen or twenty sheep were too ill to walk off the camp; these, and several others that were ailing (say) 150, were bled; about twenty of these are alive still. All the mob that could move passed on, leaving a track, marked by dead sheep here and there, for a distance of three miles. Twelve more died at the sixth camp, on Bourke Common, and two the following night. Since then very few deaths have occurred.

Accompanied by Mr. C. Gould, drover, and Mr. Inspector Mallon I visited the sheep; and, on passing the tail of the mob, a very few sickly ones could be noticed walking slowly, and carrying their heads straight, with stiff necks, not attempting to feed. The mob, both ewes and lambs, were well spread and feeding, and looked healthy.

Several dead sheep were passed scattered along the track, presenting nothing striking in their appearance. At length we reached Stone Quarry Reserve Camp, and there saw about 800 lying dead in all sorts of attitudes; some having died asleep; others having struggles in convulsions; some in groups and many apart; but all being upon a two-acre space. Almost all these were ewes; not more than a dozen lambs had died. On the fatal patch there were three sheep alive; one too ill to stand and almost unconscious; this was killed and examined. Two others had jumped on their feet; they watched us; then soon lay down again, and did not attempt to move when we examined them. Another lot of six had moved off together; these had been left behind ill; this was evident, as they had been bled and recovered; they were too lively to be caught.

About half the carcases were skinned; they were decomposing. I opened and examined some of them, but they were of no use for diagnosis. On looking through the unskinned carcases, I noticed a great many had blood trickling from the nostrils, and on the skin being removed, the characteristic bruised patches of Anthrax were unmistakeable. The butcher informed me that he had not skinned a single sheep that did not show the blood-stained patches in some part or other of the body, chiefly about the shoulders and neck.

I made ten or twelve *post-mortem* examinations, two being killed for the purpose. Three had apparently died only a few hours. The internal organs were very variably affected, and the pathological changes were not very decided in any one case, as it was at least the fourth day after the outbreak. The sheep I saw ill only suffered from a mild form of the disease, and that explained the absence of the virulent indications. The spleens of several were enlarged and dark coloured, but in some were very little affected. In one the urine was blood-stained in the bladder. The stomach and bowels were comparatively healthy.

I could see no indication of plant poisoning. I secured the spleens of two fresh cases (but the disease was not well marked in them) for further examination, and I mixed a little of the spleen blood with water and gave it to three hoggets. Fifty-six hours afterwards it had taken no effect whatever. I then introduced a seton (saturated with this blood while fresh and then dried) under the skin of the thigh in two of these hoggets, but it did not produce any ill effects. The cultivation of micro-organisms is necessary to determine whether they are bacilli or bacteria, in order to distinguish splenic Anthrax from symptomatic Anthrax.

With reference to the rumour that the *Euphorbia Drummondii* caused their deaths, it is simply too absurd; and I cannot understand the tenacity with which stockmen are content to stick to this blunder.

I went to the place and examined the feed with the drover, where he said they had eaten it (the *Euphorbia Drummondii*), and instead of finding abundance we had to search for it, and found small plants scattered about here and there, just as it is found to be the case wherever it has been introduced. I subsequently found it quite as plentiful on the town common; also in the town and near the trucking yards, where hundreds of thousands of sheep have eaten it on all occasions with impunity. At this season of the year the plant is very small indeed, and close to the ground. There was ample feed beside it. These sheep were not hungry; therefore I fail to connect it in any way whatever with their deaths.

In my opinion, Anthrax was the poison; and the germs were left on this road at this place last year during spring, when eighty sheep died out of 4,000 in one night. These germs have renewed their virulent vitality with the early spring vegetation, and hence the mortality of this mob. A similar case occurred eight miles from Bourke, on the Western Railway stock last year; then 150 died in a night in a mob of 15,000.

DRACUNCULUS MEDINENSIS IN THE DOG.

BY G. R. GRIFFITH, A.V.D., CAIRO, EGYPT.

On the 14th September, a fox terrier bitch, the property of an officer, was brought to my notice as suffering from a worm under the skin ; it had been observed a few days previously.

The worm was situated along the front of the fore-arm, extending from the elbow to the foot; it could be distinctly felt underneath the skin, coiled up like a piece of twine.

The dog appeared in good health, but an abscess had formed in the region of the foot, at the extremity of the worm.

I cut down on the worm at the elbow, and passed a fine probe underneath the body ; then by gentle traction I removed about a foot, when the worm broke. A second incision was made halfway down the radius, and about six inches more of the worm was removed, and wound round a piece of cotton wool. Finding further traction useless, the cotton wool was placed over the incision, and a bandage applied ; four hours later I again attempted to remove it, when it broke ; the remaining portion, including the head, was then taken away.

On examination, I found the worm to measure (when extracted) two and a half feet long, and from its appearance I was of opinion that it was similar to the Guinea worm found in man, but I could not find any record of its having been found in the dog. Mr. Littlewood, V.S., Sanitary Department, Egypt, kindly offered to submit the worm to Dr. Osman Bey Ghalib, of the Public Instruction Department, a well-known naturalist, who confirmed my opinion.

[Mr. Griffith has forwarded the specimen for our inspection, and there can be no doubt as to the worm being the *Dracunculus Medinensis*. So far as we can trace, this is the first time this subcutaneous filaria has been found in the dog in a fully developed state. In 1868, Professor Rivolta, of Turin, in *Il Medico Veterinaria* (p. 300), published an account of a herpetic disease in a dog, due to embryos which he thought were those of the *Filaria* or *Dracunculus Medinensis*.

Cutaneous Helminthiases in the dog has been frequently reported, *i.e.*, by Ercolani, Siedamgrotzky, Möller, Leuckart, and others ; but the dermatoses to which they gave rise were either pustular or of the nature of Scabies. It is true that more than a century ago, Hussem (*Verhandlungen van het Genvotsch te Vlissingen*, Middleburg, 1771) stated that Dœrssel had found the worm at one time in a dog at Buenos Ayres, and at another time in a dog at Curaçao. Rudolphi alludes to this statement in his *Entozoorum Historia Naturalis*. But the description is vague.

Neumann does not mention the fully developed worm being found in the dog, nor yet in any other animal, and other veterinary writers are equally silent.

In 1861, while at Tientsin, North China, we found the mature Dracunculus in an abscess on the outside of the tarsus of a horse which had been brought from India. The specimen was sent home to the late Professor Dick, and is now in the museum of his school in Edinburgh. It is, we believe, unique, so far as the horse is concerned, and this of Mr. Griffith is also the only one yet found in the dog. It will be deposited in the collection of Entozoa in the Museum of the Royal Veterinary College, London.

Fedschenko has shown that the worm makes its way into its host as a larva concealed in the body of a *cyclops* (small crustaceous animal), which is swallowed along with the water in which it lives. The young worms then reach the intestine, where they remain only a short time before they bore their way out.—Ed. *V. J.*]

FRACTURES OF MAXILLÆ.

BY MR. J. BRODIE GRESSWELL, F.R.C.V.S., LOUTH, LINCOLNSHIRE.

On October 7th, 1887, I was requested to see a two-year-old cart-colt, the property of W. H. Smythe, Esq., of Elkington Hall, which had received an extensive injury to the face while out at grass.

On examination, I found a complete fracture of the anterior maxillary bone, the lesion commencing just above the incisors, and proceeding inwards irregularly, about 4 inches. The teeth were turned inwards towards the inside of the mouth, the buccal mucous membrane was much swollen and bruised, and the teeth and alveolar cavities on the left side were crushed.

Secondly, I found the left inferior maxillary bone fractured at the symphysis and about 2½ inches inwards.

After having cast the colt, I drew out and cut away all the loose teeth and bone, and fixed the broken parts into apposition with strong metallic sutures. This latter was a task of considerable difficulty, and I was only able to draw the bones into position by twisting the wire round and round by means of a pair of strong pliers. Another difficulty was to get a suitable hold for my sutures. Before allowing the animal to get up, I dressed the wounds with tincture of myrrh and carbolic acid.

For some weeks the horse was fed entirely upon gruels and bran mashes, the wounds being washed and cleansed twice daily, and dressed with solution of carbolic acid and eucalyptus.

The parts were completely healed in about two months, although I did not extract the sutures until late in the following January.

On September 3rd, 1888, I was called to see a three-year-old black cart-horse, the property of N. Clayton, Esq., of Lincoln, at Withcall.

I was told that the colt had been kicked over the mouth by another horse. On examination I found that the anterior maxillary bone was completely fractured, the lesion in this case commencing just above the alveolar cavities of the incisors, and proceeding in an oblique direction inwards and downwards about $3\frac{1}{2}$ to 4 inches. The two central incisors were broken at the neck, while the alveolar cavities were considerably crushed, and all the neighbouring parts swollen and bruised.

After having cast the horse, I removed all the loose teeth and broken bone, and fixed the splintered jaw with metallic sutures.

All further treatment was carried out as in the case of the two-year-old. About three months afterwards all the parts were completely healed.

LAMENESS DUE TO THE PLUGGING OF THE ILIAC ARTERIES.

BY H. GRAY, ASSISTANT TO ARTHUR H. FARROW, ESQ., M.R.C.V.S., LONDON.

On June 10th of this year T. B. sent to our infirmary an Irish bay nag-horse, aged nine years, for our opinion as to the nature of the lameness of the near hind limb, and its treatment. We may here mention that the owner purchased the animal in the month of January, 1888, and from that time he worked with perfect freedom, and had never shown signs of lameness until a few days before the above date. When brought out of the stable the horse did not seem to walk lame, but when trotted he went lame in the near hind limb, which became gradually worse after going a journey. Both hocks were enlarged, and we did not perceive muscular spasms or twitching-up of the limbs. We diagnosed it as a case of hock lameness, for which he was fired and blistered in both hocks, and turned out to graze on the 12th of June. After being at grass for a fortnight, we noticed that the horse galloped about the field with ease without manifesting signs of lameness. He was brought up from grass on August 18th, and from that time he worked perfectly well without going lame, until September 3rd.

On September 3rd, after being driven a short distance, he was noticed to sway from side to side and lose control over the hind quarters, and wanting to lie down. He was taken home covered

with perspiration and suffering from colicky pains. We saw the horse about three-quarters of an hour after his arrival home, and we found no symptoms of importance, beyond the body being covered with perspiration, pawing with the fore limbs, respiration accelerated, and a frequent, thumping pulse. An aperient and anti-spasmodic were administered, and these symptoms soon abated. He was rested until September 10th, when, after being driven a short distance, the colicky symptoms, etc., reappeared. He was rested again until September 16th, when, after being led a few yards, the owner noticed him to fall suddenly lame in the off hind limb. He requested our attendance.

He was taken out into the open, and on standing behind the horse I noticed that the muscles of the hind-quarters had considerably wasted, especially the muscles of the gluteal region, leaving hollows on the haunches. The muscles of the tibial region had also undergone considerable atrophy, so much so that the heads of the tibiæ appeared very prominent. The temperature of the limbs was normal and equal. He was then walked a few yards, when he suddenly fell lame in his off hind limb, at the same time moving the trunk diagonally; after going a few yards farther he would catch up the limb spasmodically, as in Stringhalt. If made to go still farther he would hop on three legs, at the same time moving the off hind limb convulsively, and then drawing it up, so that that portion of the limb, from the hock to the foot, would be held in a straight line with the floor of the abdomen. After standing in this position for a few minutes, he would again move the limb convulsively, at the same time turning his head towards the quarter and trying to bite it, and groaning from pain; then he would place the foot on the ground and appear easy. If pushed beyond this there was a tendency to reel and fall to the ground. He was rested again for a few minutes, then taken out of the stable, when the symptoms returned.

Suspecting the blood-supply of the hind-quarters being at fault, I examined the aorta and iliaco per rectum. The pulsations at the bifurcation of the aorta and of the internal iliaco were of a feeble and non-resistant character, and on compressing these vessels I could feel a non-resistant body in the lumen. The external iliaco were obliterated and solid; in these there was no pulsation. I advised the owner to have the horse destroyed, as it was a hopeless case.

Mr. A. H. Farrow saw the horse next day, and confirmed my diagnosis.

Believing that the previous two attacks of Colic were due to this plugging of the iliacs, I further inquired of the owner the symptoms he noticed when the horse was brought home suffering from these

attacks. He stated that the horse came home trembling, perspiration running off the body, rolling of the hind-quarters, arching of the back, knuckling over of the hind fetlocks, and frequently looking round to his hind-quarters, roaring and groaning from pain. The breathing was quick and hard, the nostrils were distended, and the eyes seemed as if strained out of their sockets. There was dribbling of a small quantity of urine from the penis, which had protruded from its sheath for about one foot. There was also pawing with the front limbs, and a disposition to lie down or roll, stretching himself out full length on his side, and frequently turning his head to the quarters, groaning and roaring from pain. The horse had never been known to have suffered any illness, beyond what is described above, since he has been in the owner's possession. After these attacks had subsided he always appeared cheerful, fed regularly, and urinated and defæcated normally.

As the owner would not have the horse destroyed, Mr. Farrow obtained his consent to send the horse to the Royal Veterinary College, for Professor Axe's opinion. On the morning of the 24th September, I saw the horse before he was sent to the College. He was cheerful and spirited. The pulse was normal; also the temperature of the limbs was normal. He did not show any signs of lameness at first, but after going a short distance the cramps reappeared. He was with difficulty got to the College, a distance of some four miles. The animal had to be stopped several times, to allow the cramps, etc., to abate. He roared, groaned, and knuckled over at the fetlocks, rolling from side to side, and wanted to lie down.

He was submitted to a little exertion at the College, when the above-described symptoms reappeared; but, in addition to these, it was noticed that the venæ saphenæ were imperceptible, but after repose the vessels gradually refilled. He suffered a good deal of pain, and the hind limbs were cold, the off hind limb remaining icy cold and partially paralysed until the horse was destroyed. Prof. Axe confirmed our opinion, and the owner consented to have the horse destroyed. On September 26th he was destroyed in the *post-mortem* house at the Royal Veterinary College. Prof. Axe made the *post-mortem* examination, at which we were present. The posterior aorta for about three inches at its posterior end was completely occluded with the thrombus, which was about one inch in diameter. The clot also extended, and occluded the posterior mesenteric, and the internal and external iliac arteries.

The thrombus had considerably increased in size since I examined the vessels on the 16th. The insufficient blood-supply to the bowels, bladder, and muscles of the hind quarters during exercise accounted for the symptoms.

I may state that I saw Mr. C. Sheather's case at the College in 1884, whilst a student there. Lameness due to the plugging of the blood-vessels supplying the limbs is not so rare as some would lead us to believe.

PERSISTENT VOMITION IN THE COW.

BY G. T. PICKERING, M.R.C.V.S., YORK.

A BLUE-AND-WHITE cow, five years old (the property of a farmer), had previously enjoyed good health, was a deep milker, and in good condition. The farmer attended a sale, and bought a quantity of clover, which was mouldy. He bedded the cow with some of it, and also gave her a quantity to eat, which she partook of greedily.

She appeared all right when last seen at night. When first seen in the morning he observed that the manger was almost full of half-digested food; the cow had evidently been vomiting. He gave her a drink of chilled water, which immediately caused her to vomit; he then gave her a handful of hay, which had the same effect. Thinking there was some obstruction, he administered a dose of salts, with treacle, etc., which was immediately returned. This state of things lasted for about three or four days, and it did not matter what food she had, whether liquid or solid, it made her sick, although she did not refuse anything that was offered her, even taking her own vomit, which was soon returned.

I was called to see the cow after she had been ill about four days. She was standing with her back arched, eyeballs prominent, anxious expression, extremities and surface of body cold, skin tight, staring coat, etc.; pulse 70, weak, resp. 18, temp. 100° Fahr. Visible mucous membranes slate coloured. She did indeed look a most pitiful object. She had passed a small quantity of fæces, which was marked in flakes, thick, and greenish-black in colour. Although the owner told me that whatever she took herself, or what was administered, made her vomit, I thought I would try the effect of about a pint of tepid water. But this, almost as soon as it had been administered, caused vomition, and the following symptoms were exhibited: She rolled the tongue about, a quantity of saliva dribbling from her mouth; champing of the teeth; eyeballs bulging and rolling; the head was brought almost to the ground; the cervical muscles were fixed; the fore legs extended and slightly apart, and back arched. She then began retching violently, the abdominal muscles contracting very quickly, and the tail being slightly elevated. She then vomited a small quantity of dark-coloured fluid, and she

trembled for a short time, then appeared easy. I saw it was impossible to administer anything by the mouth, so at once passed the trocar and cannula, and then inserted a funnel into the cannula, and administered the following purgative:—

℞.—Ol. Lini. ojss, Ol. Crotonis mxx., Mag. Sulph. ℥iv.
Gent. R. pulv., Zingib. R. pulv., a.a. ℥ss. in gruel.

After the administration of the above there was not the slightest attempt to vomit, although the medicine had gone down the cannula into the rumen.

I then ordered the animal to be well whisped over, clothed well, and to be kept warm, and also allowed plenty of fresh air, etc. As I had no doubt there was obstruction of the third stomach, from the appearance of the fæces, constipation, etc., I followed up the purgative with stimulants, and small quantities of nutriment in a liquid form, leaving the following mixture to be administered every four hours—

℞.—Sp. Aeth. Nit. ℥iv., Chlorodyne ℥i.
Sp. Ammon. Aromat. ℥iv., Tr. Nux Vom. ℥iv.

Four doses—1 to be administered in 3 pints of gruel, with a little treacle, and 4 oz. of whisky at each dose. On no account was any food to be given, except what they gave down the funnel.

They gave the cow milk, gruel, linseed tea, etc. On seeing the animal next day she appeared a little better; she had not vomited since food had been administered in the way directed.

The nutriment and stimulants were on the third day continued. Someone gave her a small quantity of hay, which caused her to vomit at once. Seeing that it was no use trying to feed her in that manner, they kept on as directed by me for a few days longer, when I ordered a small quantity of gruel to be placed in the manger, which she took without causing her to vomit, and by gradually bringing her from taking a small quantity to a larger, she improved, although the appetite was for a short time capricious. I gave mild vegetable tonics, gentian, ginger, etc., and by careful feeding and dieting, the animal gradually improved and did well.

Remarks.—Here was a healthy cow which, until it had partaken of a quantity of mouldy clover, had never been ill. The clover did not seem to affect it until a large quantity had been taken; the stomach being well filled and digestion proceeding. Many people have the erroneous idea that cows will eat quantities of bad hay without any ill effects; in this case, the clover being extra bad, caused the symptoms described. I examined the clover, and could not detect any poisonous grasses or herbs; it had a foul smell,

was very mouldy, and in fact I was surprised that the farmer had given the cow such rubbish, which was only fit for manure.

I might mention that a few days after the cow had recovered, she got a small quantity of mouldy clover again, which caused her to vomit. I have often found the cannula very useful in administering medicines of various kinds, when it has been inadmissible to give them by the mouth. By administering them in this way the action is more rapid, especially when there is obstruction or paralysis, as in cases of milk fever, etc.

SKIN-GRAFTING OR TRANSPLANTATION.

BY T. ASSHETON SMITH, M.R.C.V.S., CALCUTTA.

THE above subject, as connected with veterinary surgery, should, I think, possess interest for both the profession and the horse-owning community. It appears, however, to have received little attention from either.

I venture to enter into the following details of the process, in order that any practitioner who has occasion to perform the operation may escape the discouragement and failure which attended my first attempts:—

The subject of this experiment was a Waler pony which met with an accident, skinning the near fore-leg on all sides from knee to fetlock. I have no hesitation in saying that but for the success of the treatment the results of the wound would have necessitated her destruction.

Seeing the case about an hour after the accident, I strapped up what skin remained with adhesive plaster, and put the mare in slings. Within three days, however, the skin had sloughed off, exposing bone, tendons, ligaments, etc., and it was evidently impossible that the skin from the edges of the wound (fully twelve inches apart) could have supplied sufficient material to cover the lesion. I then determined to try grafting, though with small hope of success, as I had never heard or read of its employment in veterinary practice.

During the time the mare was under treatment it appeared that the grafts "took" better as the wound advanced in age. I therefore think it probable that the want of success which attended my first efforts was due to—(1) the freshness of the wound; (2) the coarse nature of the skin I was then employing, taken from the inside of a horse's thigh; and (3) lack of experience in the process, and of knowledge of the best methods.

On subsequently trying the skin of a frog, and that of a chicken, for purposes of transplantation, I obtained some successful grafts from each; but as the latter "took" more freely, I ultimately confined myself to its use exclusively.

The *modus operandi* which gave the best results was as follows: By way of preparation, the wound should be dressed with an antiseptic, preferably a solution of bichloride of mercury (1 in 5,000) in water, firmly bandaged, and left for two or three days undisturbed. This will level the granulations and obviate the necessity of cauterisation, which should be avoided. Then having procured the chicken, a minute point of skin from the side of the body under the wing is raised with a fine forceps, snipped off with a pair of sharp scissors, and placed on the thumb-nail. With a sharp scalpel it is then divided into portions, the smaller the better, which serve as grafts.

The point on the wound where the skin is to be renewed is gently scraped with the scalpel without drawing blood, and with the point of a silver needle or probe the grafts are pressed in between the granulations.

When a sufficient number have been applied the whole wound is freely powdered with iodoform, covered with a piece of gutta-percha tissue (which is non-adhesive), and over all a long bandage of bichloride gauze is firmly rolled. In this state it is left undisturbed for a week.

The appearance of a successful graft is unmistakable; it presents a characteristic small, white speck, from which faint lines radiate.

It is important, when teasing the skin on the thumb-nail, to avoid delay, for evaporation quickly deprives it of its natural moisture and renders it dry and useless. It is also unadvisable to wash or cleanse the skin before removing it from the chicken; and it should be borne in mind that as the epithelial layer is all that is required, as little connective tissue as possible should be taken, and absolutely no fat, as it decomposes rapidly.

I believe that so simple an operation might be frequently performed with great benefit in those cases we not infrequently meet with, in which a large "sit-fast" from a saddle or harness-gall is removed with the knife, and the wound, though it readily heals, is constantly breaking out afresh, the lost skin being replaced by a very poor and inadequate substitute.

THE BLISTERING PROPERTIES OF AGAVE AMERICANA.

BY M. DECROIX, LATE PRINCIPAL VETERINARY SURGEON OF THE FRENCH ARMY.

ABOUT the year 1860, when I was in the 1st Chasseurs d'Afrique, I discovered that the *Agave Americana*, a plant very common in Algeria and Central France, possessed marked blistering pro-

perties. After having made about twenty experiments on both myself and various animals, I read an article on the subject before the Société de Médecine d'Alger.

On leaving the Chasseurs d'Afrique for the Garde de Paris in 1862, I thought it would be interesting to prove it. The agave is an exotic in our climate, but growing in a hothouse, had the same medicinal effects as when it grew naturally in Algiers. I accordingly made a number of experiments with specimens obtained from the Jardin des Plantes, the results of which were published in 1867, in the *Journal de Médecine Vétérinaire Militaire.*

Last winter I happened to find a small agave plant growing in a pot in a dwelling-room, the leaves of which were somewhat withered and faded, and by a new series of experiments I was enabled to prove that even under the most unfavourable circumstances the plant still possessed medicinal properties.

I took a well-grown leaf, removed the outer green layer, and reduced to a pulp by a hammer the inner, white, fleshy part, applying the pulp in the same way as mustard.

After a few hours, the skin became red, with pain, infiltration of the subjacent cellular tissue, and heat, just the same as if mustard had been used. Yesterday evening I applied this pulp to both my fore-arms, and I now show you the result. (M. Decroix showed both his fore-arms where the agave had been placed.) Mustard was applied to one side of the chest of a horse, and agave to the other, and the blistering effects were more marked with the latter.

In man, where a less energetic action is required, it is only necessary to rub some of the juice from a cut leaf into the skin for two or three minutes. MM. Ch. Roucher, of Gros Caillon, and Clement, of the Veterinary School, Alfort, have endeavoured to extract the principle, but have not succeeded.

The above notes on the *Agave Americana*, by M. Decroix, may be of use to those of your readers whose professional duties take them into the colonies or India. The agave, or American aloe, is a native of most warm climates, but is very abundant at the Cape of Good Hope and Mexico, and from the leaves the pite hemp is obtained, and in Mexico a drink called *pulque*. The Hottentots on the Orange River extract a poison from it, for their arrow-heads.

Joshua A. Nunn, F.R.C.V.S., F.R.G.S.,
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Pietermaritzburg, Natal.

ON THE INFLUENCE OF FILARIA PAPILLOSA ON THE HEALTH OF HORSES.

BY JOHN HENRY STEEL, F.R.C.V.S.

THE frequency of enlarged testis and œdematous cord among Arab and Persian horses is a notorious fact, and possibly is in association, as due to the same irritant influence, with relaxed abdominal rings and consequent inguinal and scrotal herniæ, lesions also very familiar among imported horses in Western India. My colleague, Veterinary Surgeon Pottinger, fully confirms my observations as to the dependence on, or at any rate association with, big testicle and dropsical cord, often filaria papillosa. Almost invariably on incision into the scrotum, in hydrocele, sarcocele, and cases of adhesions of the testis to the scrotum, one or more specimens of the thread-worm in question wriggle through the incision or come away with the hydrocele fluid. A bay Gulf Arab entire horse, four years old, slightly "down" in one hip, was admitted into the hospital associated with the Bombay Veterinary College, for treatment of debility of unascertainable origin, but extreme degree. The animal was so reduced in condition that it apparently could not long survive admission, but it continued to feed freely for a month or so before it succumbed. No amount of iron, linseed oil, or other tonics seemed to have any effect in strengthening the patient. Its food seemed well digested; its visible mucous membranes were uniformly of an extreme pallor, coat unthrifty, and appearance such that he used to be pointed out to visitors as a remarkable instance of extreme emaciation, and called the "anatomical horse," on account of his value for demonstrating osteology. A very faint yellow tinge of the conjunctivæ led us to think there might be some liver derangement, but the evidences of this were anything but satisfactory. Finally, the animal fell in the stall during the night, remained recumbent for a couple of days, and after a short period of delirium, expired. Autopsy showed merely the liver small and of a yellow colour, an *enormous* number of filaria papillosa in the peritoneal sac, and softening of the bones, so that the ilium of the side on which the animal fell shortly before death was broken through its blade. Subsequent examination of the bones after maceration, showed that they were like pasteboard in consistency. The enormous number of parasites in the abdomen led me to surmise that they were the producers of the anæmia, debility, and mollities ossium, but this view would be difficult to establish conclusively. The animal had been in Bombay for about one year, and had never been in saleable condition after import from the Persian Gulf. Filaria papillosa is almost invariably found in the abdomen of working oxen in Bombay.

FATAL DIARRHŒA IN ANIMALS CAUSED BY THE PUCCINIA GRAMINIS.

BY R. W. BURKE, A.V.D., JUBBULPORE, INDIA.

SEVERAL animals have recently suffered, in this station, from acute Diarrhœa, which has in some cases terminated fatally, where enteritis had already supervened before my arrival. I have examined the grass in each case, and found it was affected with the rust fungus, or *Puccinia graminis*. It is found chiefly on the stems and leaves of the grass, appearing as yellow patches, which afterwards become dark brown or black in colour. Under the microscope the fungus resembles very much in shape a new-pattern tennis-bat, having a broad upper extremity, with a handle to it, the network of the bat containing many granular particles, or nuclei.

The principal symptoms which are noticed in animals fed on this fungus, are Diarrhœa, straining, and Colic, followed by Enteritis, and, finally, death resulting in animals in which treatment was not adopted during an early stage of the disease. Suppression of the urine was noticed in most cases. Tympany, due to paralysis of the muscular coats of the intestines, was always an unfavourable symptom; so also were palpitation of the heart, muscular tremors of the body, sinking of the eyes, with dilatation of the pupil, and convulsions, which always preceded death. The duration of the disease was about twelve hours, only a few of the cases being prolonged to twenty-four hours or more, after which the prognosis was generally favourable if a relapse did not occur. That the above symptoms are due to the fungus, was proved by me in Cawnpore, by experimentally feeding ponies on grass containing it, and which succumbed to the disease in a few hours.

The only treatment I found of any avail was, in the early stages, to give preparations of ammonia (in preference, the carbonate of ammonia), followed by sulphuric acid. The ammonia was specially valuable in cases showing cardiac complications, with interference of the circulation due to plugging of the blood-vessels, seen *post-mortem*. Rice-water, linseed-tea, etc., were given freely as emollient drinks.

I may here remark that several sheep and cows belonging to natives have lately died in this station, and on inquiry I learn that the cause of death in these was "acute Diarrhœa and paralysis of the hind-quarters." I have no doubt that the cause of death here also was due to the *Puccinia graminis*, seeing that this fungus has been met with in so many bundles of grass I have now examined, which was cut in cantonment. I may mention that a similar outbreak was witnessed a couple of years ago in the Bengal Cavalry horses stationed at Cawnpore, and which I reported at the time in the VETERINARY JOURNAL of April, 1887. As I do not remember to

have seen the same train of symptoms in the horse, caused by this fungus, described in any of the veterinary works I have consulted, I send the above short notes for readers of the VETERINARY JOURNAL.

COLOTOMY.

BY S. R. HOWARD, V.S., CIRCLEVILLE, OHIO, U.S.

ON 6th of September, James Swearigen, farmer, gave us a boar pig, over four weeks old, having imperforation of the anus. It was lively and bright, notwithstanding that there was an anal tumour, which presented the appearance of an inflated bladder of pigskin. I never saw such distension.

The animal being laid on its side and held, the anus was sought for on the track of the perineal *raphé*, by the usual method of crucial incision and exploration.

No trace of rectum or imperforated anus could be found in the pelvis by the little finger or probe. Despairing of successful treatment, a blunt director was rather recklessly pushed forward into the abdominal cavity, after the withdrawal of which a sharp spirt of meconium escaped. The director was again introduced, but the previous puncture could not be discovered.

The hair was then removed from the left flank, and an incision was made about an inch long, downwards and forwards, including the peritoneum; a portion of the colon pressed very firmly against the borders of the incision, threatening to tear the incision larger.

Six or eight stitches were passed through the edges, including a snip of the intestine, which was then opened by a good-sized puncture. The flow was copious, to say the least of it.

We placed him then in a comfortable pen, from which he escaped, and was gone for a week, when he was then discovered in a corn-field about a mile away. After a fruitless chase, I gave him up as a dead pig; but, to our astonishment, a countryman returned him in a few days. The stitches were all loose, except one inferiorly. The loose ones were removed, and the border of the punctured intestine was found to be attached around the edges of the flank incision.

The creature had a cold, so milk and alcohol were exhibited. Next day he was apparently well, and has remained so ever since. He is growing very vigorous, and is in splendid condition, if not very *pretty*.

Defæcation is both voluntary and involuntary. When the former occurs the left hind limb is forcibly pointed backwards, and the usual mechanism is brought into play.

My preceptor, G. W Butler, V.S., tells me of several analogous cases, but none as favourable. This shows the endurance of some animals.

Editorial.

OPERATIONS ON THE LARYNX.

In the Journal for last July, in an article on laryngeal surgery, we referred to what we had done in operating directly upon that organ, and stated that it was no longer a *terra incognita*, but that we had found it readily accessible to the fingers and the vision of the surgeon, no less than to his surgical instruments. So long ago as 1878, we had satisfied ourselves on these points, and certainly we may lay claim to being the discoverers of this new field for operative interference; as until that time, and indeed until publication of our proceedings this year, no one had ventured to open the larynx, at least in this country, with the view of performing operations in its interior. True, the trachea had been opened at some distance from the head by Gunther and two or three other veterinarians, and the interior of the larynx was reached in that way; but so far as can be ascertained, the larynx itself was not opened, probably because most serious consequences were apprehended. Accidental fracture of the thyroid cartilage of an aged horse in 1878, and an attempt to remedy it, proved to us that there was very little danger indeed in penetrating the cavity of the larynx and manipulating its several parts, so long as ordinary care was exercised. The experience then gained engendered the hope that the morbid condition which gives rise to chronic Roaring in horses might be removed by direct operation upon the larynx itself, instead of attempting it through the trachea, as Gunther and others had done unsuccessfully. Not only this, but other serious conditions of the larynx, and even certain parts of the pharynx, could be ascertained, and dealt with surgically or medically, by the same operation; while hitherto obscure notions with regard to the physiology of the organ could be elucidated in the most satisfactory manner through the laryngeal incision.

To a large extent these hopes have been realised, and a great addition has been made to our knowledge of laryngeal physiology; while as for the pathology and surgery of the organ, a new epoch has been entered upon. With regard to operation for Roaring, much interest and comment have been excited, and the proposer has had the usual amount of acrimonious criticism from a few who do not appear to have been in any way qualified to criticise. We have been told, for instance, that there was no novelty in our mode of operating for Roaring, that it had been practised by others years ago, that the operation was absurd and contrary to all knowledge and principles, that we had failed, that we had disgraced ourselves and the profession, etc. All this puerile nonsense we could well afford to disregard, as it had no foundation whatever in fact, and was only uttered from very unworthy motives; and also because we had no interests to serve but those of the profession,

to the welfare and progress of which we have devoted our life, our energies, and our means.

Our efforts appear also to have incurred the disfavour of a surgeon who has ventured to transfer some of his attention from mankind to horses, and for something like twelve months has been endeavouring to "cure" Roaring; indeed, he announced not long ago that he had *cured* two horses. Fearing, evidently, that we might gain credit for our attempts, he subsequently (in a military journal!) published his observations and the results of his operative procedure in cases of Roaring; from which we learn that his operation is one of a very difficult and grave character, that it in no respect resembles the operation we have had practised, neither in effectiveness, simplicity, safety, nor in other important advantages, and that the supposed cures cannot be in any way regarded as cures.

We glean that Mr. Clarke's operation consists of—1st, Opening the *trachea* to ascertain whether the horse is a roarer, and inserting a tracheotomy tube; 2nd, Making a large triangular incision (6 to 8 inches) through the skin behind the jaw on the left side, reflecting the angular flap upwards, ligaturing the jugular vein in two places, and removing the intervening portion; 3rd, Cutting or tearing through the fascia to expose the side of the larynx, care being taken not to injure the parotid gland or duct, which are in close proximity; 4th, Ligaturing the laryngeal branch of the thyroid artery; 5th, Dividing the inferior constrictor muscle to the thyroid cartilage and crico-thyroid muscle; 6th, Dividing the superior laryngeal nerve, and ligaturing its accompanying artery; 7th, Disengaging the wing of the thyroid from all its attachments; 8th, Removing the arytenoid cartilage. On one occasion a portion of the thyroid cartilage was removed, which caused the framework of the larynx to fall in. On another occasion none of the thyroid was removed, and the vocal process of the arytenoid was left, a couple of sutures being passed through it, one being brought out through the thyroid, the other through the cricoid cartilage. It will thus be seen that the operation is not only a most serious mutilation, but so far as its results are concerned—even if it prevented Roaring, which is very doubtful—it might prove even worse than the morbid condition it is designed to remove. We know the functions of the superior laryngeal nerve, and these are abolished by its division; and we are also well acquainted with the effects of obliteration of a jugular vein. Only two horses affected with Roaring were operated upon; a third was supposed to be a roarer, and three horses, which were not affected in this way, were subjected to operation. Of the six horses, one died as a result of operation, and all were killed, one of the roarers after being five months at grass, the other after three and a half months. The latter was tested by being made to go round a yard (if at the Brown Institution, the space is about the dimensions of a good-sized drawing-room), and it did not make a noise. It is not mentioned how the other animal was tested, but Mr. Clarke *thinks* both animals were cured. The fact that they were not tested by severe and continued exertion—they being worn out—and which is, after

all, the only certain test, renders us very doubtful indeed as to their being cured. We may state that worn-out horses are not fit subjects to try in this way, and that we prefer horses in full vigour, and which can be subjected to a two or three miles' gallop in the open country, in order to ascertain whether operation has been beneficial. Such are the horses we have had the simple, easy (comparatively), and safe operation performed upon; for of a large number not one has died from it; and the result will shortly be placed before the profession. We may mention that the value of this method of operation has been fully shown by our friend and worthy colleague Dr. Mœller, of the Berlin Veterinary School, who has been successful in removing Roaring in twenty-two of thirty horses operated upon, and this without deaths, ligaturing veins and arteries, or dividing important nerves, as well as endangering important organs and structures. We shall hope to show still better results.

ANTHRAX IN SWINE.

BY PROFESSOR EDGAR CROOKSHANK, M.B., KING'S COLLEGE, LONDON.

It was high time that the much-disputed point as to whether swine could be affected with Anthrax, should be finally put at rest by the Veterinary Department, Privy Council, and Professor Brown may be congratulated upon the able agent he selected to settle the matter.

Perhaps, in the dim and distant future, a bacteriologist may arise from the ranks of the veterinary profession, competent to carry out these investigations; and should we, at that remote period, still be in the land of the living, the event will cause us unmitigated joy, for it will mark a distinct forward step on our part. In the meantime, it is not too much to say that the profession has every reason to be proud of its ally, who seems destined to render it many important services.

Dr. Crookshank's paper takes us rapidly through the history of Anthrax in swine, in the shape of a short *resumé* from Fleming's "Manual of Veterinary Sanitary Science and Police"; he next gives a synopsis of several outbreaks, diagnosed and recorded by Mr. Wilson, of Berkhampstead, which are very interesting; and then he describes the various experiments carried out for the purpose of—

(*a*) Ascertaining the result of the ingestion by swine of the viscera of a bullock which had died of Anthrax.

(*b*) Ascertaining the effect of ingestion by swine of putrid offal from animals slaughtered in health or dying from causes other than Anthrax.

(*c*) Ascertaining the result of inoculation of swine with the blood of a bullock which had died of Anthrax.

(*d*) Ascertaining the result of inoculation of pigs with the blood of a guinea-pig which had died of Anthrax.

(*e*) Ascertaining the effect of inoculation of swine with a pure cultivation of the Anthrax bacillus.

(*f*) Isolating the Anthrax bacillus from an outbreak of Anthrax in swine at King's Langley.

The results were as follows—

(*a*) Anthrax was produced in swine by experimentally feeding them with Anthrax offal.

(*b*) The disease was communicated to swine by injection of the blood of a bullock which died of Anthrax.

(*c*) Anthrax was passed through the guinea-pig, and transmitted to swine by injection of blood from the spleen.

(*d*) Anthrax was produced in swine by injection of a pure cultivation of the Anthrax bacillus.

(*e*) From cases in which the disease was accidentally induced in the farm-yard, the Anthrax bacillus was isolated and Anthrax reproduced in guinea-pigs and mice by inoculation with the blood from the spleen.

(*f*) Anthrax can be communicated to young and old swine. If the disease is induced by ingestion, the tonsils are found to be ulcerated, and enormous swelling of the throat is, in such cases, a characteristic symptom.

It is also important to note that there is a rash-like discolouration of the skin, sometimes loss of power over the limbs, and a general weakness and disinclination to move; or the animal may lie helplessly on its belly and utter plaintive cries when disturbed. Dr. Crookshank further on calls attention to the fact that the spleen may be normal in size, and pale and flabby; whereas in other cases it is characteristic of Anthrax.

He states that the examination of the blood of the heart and spleen for Anthrax bacilli must be carried out with perseverance and discrimination, as they were only present in small numbers, and in some cases had given place entirely to some septic organisms.

Dr. Crookshank very justly considers this point to be very important, because it may often happen that control experiments upon guinea-pigs and mice may produce malignant œdema or other forms of septicæmia, owing to the destruction of the Anthrax bacilli by other organisms.

It has been necessary to omit the details of the experiments, but we have quoted as nearly as possible the author's words. Those of our readers who desire to make themselves more closely acquainted with the details, are referred to the Proceedings of the Pathological Section at the Annual Meeting of the British Medical Association held in Glasgow in August, 1888.

INOCULATION AND PLEURO-PNEUMONIA.

In a recent report of the local authority for the county of Perth, read at a meeting held in October, the following reference was made to a case in which inoculation had been tried for Pleuro-pneumonia at Drumkilbo: In this case thirty-two cattle were inoculated on 11th February last. Ten of these, of which one died, and nine were slaughtered previous to 19th September, were found on *post-mortem* examination free from Pleuro-pneumonia. But on the latter date the remaining twenty-two were slaughtered, and on *post-mortem* examination two of these were found to be the subjects of encysted Pleuro-pneumonia, showing that disease may exist for upwards of seven months in cattle after inoculation without discovering itself.

Colonel Stirling, of Kippendavie, in moving the adoption of the report, said that he wished to say a few words in regard to the Drumkilbo case, because, although the committee had so worded the report as to leave the general public to form their own opinion, yet while he was chairman of the local authority he felt it his duty to express his own conviction for what it was worth. At one time he was very strongly in favour of a more thorough trial of inoculation, and believed that it could be used with advantage, but the Drumkilbo case had shown most conclusively that inoculation was not to be trusted to eradicate Pleuro from the country. In the evidence submitted before the Highland and Agricultural Society they were assured of two points —first, that a diseased beast would not take inoculation; and secondly, that if it did the effect was to bring out the disease far more strongly than ever. These two contentions were absolutely knocked on the head by the result of

the Drumkilbo case. The animals there were inoculated in February, and slaughtered in September. In two of them traces of encysted Pleuro were found. If, therefore, the animals were diseased before inoculation, it was perfectly clear that the inoculation failed to discover and develop the disease. If, on the other hand, at the time of the inoculation the cattle were not diseased, it became clear that inoculation was valueless, because they must have taken the disease afterwards, and the fact remained that for many months, as could be seen by the condition of the lungs, those animals must have been diseased, while all the while the inspectors and Mr. Drummond Forbes reported them to the committee as apparently perfectly healthy. As long as any part of the diseased lung was soft, and during the whole time the process of encystment was going on, those animals were a source of disease. Therefore, to contend that, because the remaining portion, twenty animals, remained healthy it proved inoculation as of value to eradicate the disease, he held was not a good argument. He did not deny the efficiency of inoculation as a certain kind of preventive, but that was not what they wanted. They desired to eradicate the disease, which was not indigenous, from the country. In proof of the satisfactory result from the slaughtering of cattle under the recent Order, he might mention that the disease was steadily decreasing in Scotland. During the first quarter of the year there had been eighty-seven outbreaks, in the second quarter sixty-four, and thirty-six in the eleven weeks of the third.

THE IRISH VETERINARY DEPARTMENT.

AFTER a loug period of service, Mr. Ferguson, who held the high-sounding title of Her Majesty's Veterinary Surgeon in Ireland, has been retired, and Mr. Hedley, F.R.C.V.S., has been promoted by the Irish Privy Council to the office of Chief Inspector—an office of heavy responsibility, but which he is entirely competent to assume. Mr. Prentice, M.R.C.V.S., has been appointed to the vacancy made by Mr. Hedley—that of travelling inspector.

THE VETERINARY SURGEON'S DIARY FOR 1889.

It has often occurred to us as a matter for surprise, that among the numerous diaries, visiting lists, and pocket-books issued year after year, the wants of the veterinary profession—and they are scarcely less urgent in this respect than the medical—should be unthought of or ignored. True, it is much the smallest of the professions, and naturally the commercial aspect comes into the calculation; for we hear on all sides that diaries are so much more expensive to turn out than ordinary books of the same size (and, moreover, must sell almost as soon as issued), that unless a large demand can be looked for, a considerable loss must ensue. Notwithstanding these difficulties, and others which have presented themselves from time to time, the enterprise of Messrs. Baillière, Tindall and Cox have determined them to try the venture for the coming year; and it will then be for the profession to decide whether they will accord sufficient support to meet the outlay, and thus ensure the annual publication of a work that should be to every practitioner almost as necessary as his food.

HORSE DISEASE IN BURMAH.

THE *Army and Navy Gazette* says :—"We hear from Burmah that the disease *Surra*, always worst during the rains, has been again playing havoc among the cavalry horses in that country. E Troop, First Madras Lancers, has lately marched in dismounted to Meiktilla from its former post, Shamayne, leading

one horse, the sole surviving animal of two officers' chargers, sixty-one troop horses, and thirty-two grass-cutters' ponies, which were present with the troop on May 12th last, the date on which the disease broke out. F Troop has also been very unlucky in this respect, having already lost sixteen troop horses and three ponies from the same disease, and having thirteen cases of *Surra* now lingering on. The disease is absolutely incurable, so these, too, must eventually swell the death-roll. In other words, in one squadron, out of 100 horses, 89 have died within the last three months. Since the arrival of the 1st Madras Lancers in Burmah, just two years ago, the regiment has lost in all 371 horses. Considering that the average price of the Government remounts of the Madras Cavalry is 740 rupees for Walers (in Madras), and nearly that amount for Arabs and Persians, it will be seen how great the loss is. And much of it might have been avoided but for the short-sighted policy of the Government of India, in starving its veterinary staff, which is totally inadequate to the wants of the service, and consequently so overworked that proper veterinary aid is impossible."

THE HORSE-SUPPLY OF SOUTH AFRICA.

MR. NUNN, Army Veterinary Department, was sent on a special mission to South Africa, in order to study and report upon the disease known as Horse-sickness, and, during the season when that scourge did not prevail, to investigate the resources of that great country as to horse-supply, and state if any and what improvements in breeding were required. We have already published his very able and interesting reports on the first subject; we now have pleasure in presenting that on the second. It may be mentioned that Mr. Nunn travelled more than 8,000 miles during this investigation.

FROM VETERINARY SURGEON, 1ST CLASS, J. A. NUNN, ARMY VETERINARY DEPARTMENT,

To the Principal Veterinary Surgeon to the Forces.

Cape Town Castle, *15th February*, 1888.

SIR,—In accordance with instructions conveyed in your letter marginally noted, I have the honour to forward for your information the following report as to the Horse-supply of South Africa.

Looking on the matter in the light of a source of supply for remounts for the Indian and home Armies, price obtainable, cost of transport, and, if I may use the expression, from an Imperial point of view, also in a Colonial light, as to the best steps to be taken to improve the existing animals, markets to be found, and as this report will, in all probability, pass into the hands of the civil authorities and other persons who may be ignorant of professional knowledge, and not be horsemen, I trust I may be excused if it is written more in the style of a narrative than an ordinary official report, which would have been the case had I thought that the perusal of it would be entirely confined to the military authorities.

I first started from Pietermaritzburg, in Natal, for Cape Town, on August 30th, 1887, but as the officer commanding wished to consult me relative to some matters that had arrived from England in the mail that I left in, I had to leave the ship at Port Elizabeth and return to Pietermaritzburg. I left Natal again for Cape Town on September 28th, and in Appendix A I give a table taken from my diary, showing the journeys I made and places visited, by which it will be seen that the distance travelled by me was 2,632 miles by sea, 4,542 miles by rail, and 1,664 miles by road, making a total of 8,838 miles from the date of my first leaving Pietermaritzburg.

While speaking of this matter, I must mention the kindness of the authorities of the Cape Government Railways, who provided me with a free pass over all the lines in the Colony, thereby saving me an immense amount of trouble.

The tour taken by me can be divided into three parts: 1st, through the Eastern Province and Hantain; 2nd, the Western Province; and 3rd, into Basutoland and the lower part of the Orange Free State. The routes taken and the districts I visited are shown in the sketch map, Appendix B.

By the kindness of Colonel Bailey, C.M.G., I was also allowed to inspect the horses of the Cape Mounted Rifles, at their head-quarters at King William Town, and the detachment at Palmeit Fontein, on the Orange River. These horses are small, but, for the service they are required, most useful.

Looking on South Africa as a source from which remounts could be obtained for heavy Dragoons and medium Cavalry, I am of opinion that at present only a limited number could be found; that is to say, horses that could compete side by side on their own merits with those purchased in Ireland and the Australians imported into India; although no doubt, in times of emergency, especially if the standard were somewhat relaxed, a certain number could be found suitable for light or irregular Cavalry.

I think that it is pretty well allowed, even in the Colony itself, that the Cape horse has deteriorated, and that the class of animal that was imported into India before the Mutiny has, to a great extent, died out. And my own experience agrees with this; for when I first went out to India there were a few Cape horses in the country, and certainly they were different animals from the general run I have seen in the Colony. Of course, the falling off in demand, due to the opening of the overland and Red Sea route to India, has had much to do with it; but I think that the actual cause of this deterioration is in the Colony itself, many farmers having abandoned horse-breeding for ostriches, merino sheep, and angora goats, which some years ago paid very much better. But the class of stallion imported of late years is, in my opinion, the chief factor.

There has been a desire to breed race-horses, and a number of thoroughbreds have been imported from England. Now it is no good disguising the fact that, as compared with New Zealand and the Australian Colonies, the Cape is a poor country, and that importers could only in a very few instances, "which could be counted on the fingers of one hand," afford to pay for a really first-class thoroughbred; by which I mean an animal that would be likely to become a valuable sire at home; and consequently, as a fashionable pedigree was insisted on, other qualities, such as bone-power, etc., were all sacrificed for blood, and a very inferior animal obtained. In the company they met with in the Colony, and in short events on the flat, these animals were successful, no doubt, so far as their racing careers were concerned, and being well known on the turf, they were sought after for breeding purposes. In many cases some of their stock were also successful; but the fact was quite overlooked that a brilliant turf record is no guarantee of what a horse will do at the stud, especially for breeding useful hacks and harness horses; but very often it is quite the reverse, and this is the mistake that has been fallen into. To my mind, the system of making most of the big races handicaps has a great deal to answer for, as it most effectually puts a stop to any inducement to import a good horse; for what object is there in doing so with the knowledge that, after winning one or two races, a really good horse will be handicapped down to the level of a £50 screw that, although he may with a feather weight run away with a five or six furlong race, is incapable of carrying a man's boots over a potatoe-trench? I would suggest that something be done to remedy such a state of affairs, by making a few of the more important races either weight for age, with penalties and allowances, or else

fixing the maximum and minimum weights to be carried. In breeding race-horses, especially for the South African turf, a fact that has been overlooked is that for one that turns out well many will be utterly useless for any purpose whatsoever, being merely blood weeds, and this is a class of animal that is now only too plentiful in the Colony; many of the entries, solely from their pedigrees, finding their way as stallions into the more remote parts and amongst the smaller farmers, the fillies being also in their turn used for breeding purposes. Before leaving this subject, I must remark on the want of judgment that is shown in many cases in the selection of mares. I have seen, in many cases, all that are bred on a farm running loose in a mob together, the stallion being turned adrift amongst them, no effort being made to cast or get rid of the unlikely ones. The droughts that the country is at times subjected to is, of course, very detrimental to young stock, and the small and stunted growth of many of the South African horses is undoubtedly due to this cause, the pasturage being burned up, and the mares and foals being half starved. The natural remedy for this state of things is, of course, to feed artificially with oats, hay, forage, etc.; but this is expensive, and I believe not practicable. Whether this is the case or not I am not sufficiently experienced, nor am I in a position, to determine; but to a stranger in the Colony there is a fact that strikes one as being singular—viz., that whereas on one hand I have been told, when it has been suggested that mares and young stock should be fed, that it cannot be done, as it is too expensive; on the other, almost universal complaints are made that it is not worth while growing crops, as the price is so low that it does not pay; so much so that, on my remarking to one farmer on the splendid crops he had, he began lamenting that they were so good, as it would keep the price of produce down. In times of scarcity, and in fact always, it is customary to allow the foals to run until they are eighteen months or two years old, then take them up and feed those it is intended to sell or work. Of course, if there is any grazing this plan works well enough; but if there is not, by the time the young animal is brought in his growth is permanently stunted by a course of starvation. Under these circumstances, supposing only a year's artificial feeding can be afforded, would it not be better to give it to the foal while young, and then when he had a certain amount of stamina and power of resistance to let him take his chance, than to wait until the damage is done, and then attempt to repair it? These droughts and the want of natural grass are a great obstacle, and one that I am afraid will seriously interfere with South Africa competing in the Indian horse trade with Australia; but, however, the whole country has not these drawbacks. As to the geological and physical features and conformation of South Africa, it is not necessary for me again to speak, as I have entered into it at some length in a former report I forwarded to you on Horse-sickness in Natal. Suffice it to say that in the southern and western portions of the Colony, especially the Piequetburg district, about Saldhana Bay, the Great Berg River, and in the Caledon and Swellendam districts, in many places there is excellent grazing. The same applies to the eastern frontier about King William Town and the Kei River; though unfortunately, being somewhat low-lying and to the east, Horse-sickness is at times prevalent; but in the places mentioned on the West Coast such is not the case, which fact I have previously explained in my report on Horse-sickness in Natal, by the two prevailing currents, the Antarctic and Mozambique, meeting at the Cape. Basutoland should be a first-rate horse-breeding country, lying, as it does, at an elevation of some 4,000 to 5,000 feet above the sea, with a temperate climate in which Horse-sickness is unknown; droughts are not very common, and the hills are covered with good grass; in fact, the ponies of Basutoland are famous through South Africa, but of these I have to speak further on.

Of the strength and endurance of the South African horses there is no question, they being capable of performing immensely long journeys over very bad roads in hot weather, and on nothing but what they can pick up on the Veldt, or a little oat-hay forage. They are also wonderfully good-tempered and quiet; even entire horses can be left tied up with a lot of others with safety. They are, as a rule, very sound; splints are the most common form of lameness, spavins and ringbones being comparatively rare. This is altogether the reverse of my experience in India, where these two latter, with curbs, are very common; but in that country it can be accounted for by the sharp bits the natives ride with, and the iron cross hobbles that are used. Thickening of the inferior metacarpal ligament and sheaths of the back tendons is very common, from the practice of knee-haltering, but I have seldom seen it cause lameness. The hoofs are remarkably sound, a good many persons working their horses for long distances over rough ground without shoes. In fact, a Basuto pony is never shod at all. Diseases of the respiratory system are almost unknown; in fact, I have only seen two roarers in South Africa. I have, however, noticed a number of cases of cataract, both corneal and lenticular, which I attribute to ophthalmia, caused by the heat glare, and above all, the flies in the summer.

These are the good points of the South African horse, but I must now give the reverse side of the picture.

He is small and stunted in growth, generally about 14·2 to 14·3 hands high, only a few being much taller; deficient in bone, few, if any, measuring 7¾ inches below the knee; pinned in at the elbows; good shoulders and forehand; narrow chest, very badly coupled and ribbed up, with bad, drooping quarters, badly developed muscles of the croup and thighs, split up behind, with crooked hind legs; the hocks being very far back, or to use a slang, but somewhat expressive term, "in the next parish to the body." In fact, to sum up the whole matter, the South African horse is, although small, good before, but bad behind the saddle. It may be perhaps asked, If the breed has so fallen off in point of size and weight-carrying powers, how is it that from a commercial point of view no steps have been taken to rectify it? This is easily answered. As the population of South Africa is, as a rule, not horsemen, that is to say, they do not generally ride, but perform long journeys in Cape carts, and, as I need hardly point out, a much greater weight can be conveyed by draught than in the saddle, the present small, hardy animal is found to answer the purposes required of him. Another reason why larger animals are not bred, such as are obtained in India from Australia, is that most of the farm work, such as ploughing, drawing waggons, etc., is all done by bullocks or mules; and as big draught-horses are not wanted, and eat more than the smaller description, there has been but little inducement to go in for increased size.

As one of the chief causes of deterioration of the South African horse is the inferior light-blood breeds that are imported as stallions, one of the first steps I consider necessary is to get proper sires. In my opinion, there is no horse to equal a good English thoroughbred, but in using the word thoroughbred I do so advisedly. I do not mean that any clean-bred horse that is in the stud-book should be used, no matter how well he is bred. The sort of horse I mean is a clean-bred one, well ribbed up, 15·3 or 16 hands high, with good shoulders, back, and loins; strong, well-developed hindquarters; good girth of bone, nothing that measures less than 7¾ or 8 inches below the knee being used, and with big hocks well under him; in short, a thoroughbred that would be able to carry a 13-stone man to hounds in a deep plough country like the Vale of White Horse or Blackmoor Vale. This class of animal is, however, very scarce, and is what every one is looking for, and it would not be a matter of paying in hundreds, but thousands of pounds, and even

then he would be difficult to find. I am quite aware that many will not agree with me in my preference for the thoroughbred, and probably I shall have their failure in the Indian studs pointed out to me; but with all due deference, I beg most respectfully to state that in my opinion the thoroughbreds sent out to India were, with a few exceptions, not by any means first-class animals. As the price is prohibitive, and the thoroughbred horse I have described out of the question—for I would most strongly urge that an inferior class of animal should not be imported—the sort of sire I should use would be a three-parts bred Irish or Yorkshire hunter, a Cleveland bay or Norfolk trotter, and of this last I shall have to speak more fully. As I have before said, if money were no object, and he could be obtained, I would use a thoroughbred; but as it is a consideration, then get an animal with size, power, bone, and substance, and as much breeding as can be afforded, but do not sink all other considerations to pedigree, which has unfortunately been done. The sort of horse that would best fulfil these conditions would, I think, be more easily obtained in Ireland than elsewhere, unless, indeed, he could be found in Australia or New Zealand. This is a question I am not in a position to answer, never having been in either of those Colonies; but from the class of Waler I have seen imported into India, I am strongly inclined to think that the kind of sire required for South Africa is to be found there; but this is a matter I must leave to others. I think that there would not be the slightest danger in introducing three-parts bred horses, for whatever her bad qualities may be, the South African mare cannot be said to be wanting in breeding—on the contrary, there is generally too much of it.

After the Zulu war a number of English mares were sold in the Colony, and used for breeding purposes; the first year few held to the horse and were barren, and this gave rise to an absurd notion in the Colony that the mares in the British Army were all spayed. This experience quite confirms what I observed some years ago in the north of India, where cast horses from the British Cavalry and Artillery were handed over to the department of horse-breeding operations for sale to breeders in the country. But few proved in foal the first year they were put to the horse, but in the second and third year most of them did. This was particularly noticeable with animals over fourteen years, and was mentioned, if I recollect right, in the General Superintendent of Horse-breeding in India's Report for the year 1883-84. From inquiries I have made, I find that the same has taken place in South Africa, and it stands to reason that if a animal that has been fed, stabled, and look well after for eight or ten years is suddenly turned loose in the Veldt to pick up her own living, such an amount of constitutional disturbance will take place as to upset some of the functions of the body; and that of generation being the most delicate and complex, is the first to show this condition of things. The prejudice against these animals, or, as they are generally known, "Lancer mares," has been overcome, and they are now greatly prized, and one has only to look at the foals to see the difference between them and those of the Colonial mares.

If they can be obtained, good upstanding Clevelands would be a good class of sire, but then they also are difficult to obtain and expensive; moreover, in my experience, although this is a class of horse I have not had very much to do with, he is rather inclined to be long in the barrel, slack ribbed up, and to run to leg; and these are points that should be carefully avoided. However, if Clevelands of the proper stamp can be found, I see no reason why they should not prove useful sires, and "nick" well with the Colonial mare, especially for breeding harness-horses.

The Norfolk trotter, or roadster, is an animal that requires some remarks, and I would most strongly urge the necessity of exercising the greatest care

in his selection, as there are Norfolk trotters and Norfolk trotters, some very good, and others equally bad. Now the pure-bred, clean-limbed Norfolk trotter is an excellent horse, and would, I think, be an excellent sort of stallion for South Africa; and moreover, there is the advantage of his not being of so prohibitive a price as the thoroughbred. He is a thick-set cobby horse, the only disadvantage being, perhaps, that he does not stand very high; but taking all things into consideration, this can be passed over, at all events for the first or second generation, as he would certainly give to his stock the bone and size that they are now so lamentably deficient in; but I would most strongly object to the heavy, hairy-heeled Norfolk trotters, many of which are seen that are probably by a Norfolk trotter out of a cart-mare. I have had some experience with this class of horse in India, and the result was anything but satisfactory. It was found that the cross was too violent, the stock being big-carcassed animals, with the body of the sire and only the limbs of the dam to support it; and this is certainly what should be avoided.

It has been suggested by some farmers that the Clydesdale and Shire draught-horse should be imported, but this I cannot agree with, as I am certain that the same result would be seen in their stock as I observed in the under-bred Norfolk trotter in India, for the Cape mare in many respects resembles the Northern Indian one. Furthermore, there would, with the exception of a few places like the docks at Cape Town and Port Elizabeth, be no use for them, as the work on farms is done by bullocks; and if the colts have to be turned out, South African fashion, on to the Veldt to pick up their own living, they would simply starve, as such big animals require feeding.

While on the question of bullocks working on horse farms, I cannot help remarking what to a stranger seems a singular waste of power, in seeing a mob of brood mares running wild and unbroken, and the ground being tilled by oxen or mules. Surely the mares could be broken in, and although not worked hard, they might do enough to earn their own living, as is done in England and Ireland.

One or two Pecheron and Norman stallions have been imported, and in certain quarters have found favour. This is a class of horse I do not personally know much about, but I should be inclined to think that they would be phlegmatic and soft. They are certainly largely used in the omnibuses in Paris, and the heavy Dragoons, Cuirassiers, and Artillery in the French army are mounted on them; but some were imported several years ago for the London tramways, and did not give satisfaction. At all events, extreme care should be taken, as I see by a late number of a professional paper that in America Equine Syphilis, or Maladie du Coït, has been introduced by some Pecheron stallions, and is spreading rapidly. This disease is up to the present unknown in England or South Africa, but if care be not taken there is no knowing when it may be; and this is a matter that I think it would be most advisable for the Cape Government to give some attention to, otherwise a new disease may be added to the already too numerous list of those known in South Africa.

A sum of money has been voted by the Cape Parliament, for the purpose of procuring stallions to be placed out in the country, and this is certainly a step in the right direction; for in a poor Colony like this, unless the Government steps in and lends a hand, the breed will go on from bad to worse. If properly worked and sufficient time is given, the scheme, I have no hesitation in saying, will be a success; but it cannot be done in a day, and it is absurd to expect that a year or so will obliterate the effects of long years of neglect. Moreover, politics are somewhat uncertain in the Colony, and it remains to be seen whether a succeeding Parliament will grant money to keep the scheme

going, or whether it will be abolished. If, however, the stallions are kept up, I would suggest their being utilised somewhat on the plan of the horse-breeding operations in India. They might be placed in charge of some official of any of the existing agricultural societies in the Colony, who would take an interest in the matter. A most important point, I think, in making them a success, is that their services should only be allowed to selected mares, and that the number be limited. If any inferior mare is served, the colt turning out not to the satisfaction of the owner, the horse will be blamed and get a bad name, as no man will admit his own animal is bad, and every one, especially the more ignorant portion of the population, will expect all colts by the Government horses to be superlative in quality. The persons who, I think, should be more particularly encouraged to use the Government horses are the small farmers, men who own one or two mares. These are the people who can make horse-breeding pay, for one or two colts running about their farms pick up their own living, and practically cost nothing. If they die or go wrong there is no loss, and if they turn out well whatever they fetch is clear profit. This class of farmer is usually somewhat ignorant; he will not go far to look for a horse to put his mare to, neither will he pay much of a fee, and the probabilities are that he puts a fairly good mare to the first inferior brute he comes across, of which there is no lack in the country; whereas if he could get the services of a Government horse for nothing, or for a nominal sum, and knew where he could be found, there would be more chance of a good foal being born. For this reason I think that, at all events at first, till they were well known, the services of the Government horses should be given free; afterwards, when the system got on a sound footing, a fee might be charged. Of the large farmers and magnates of the land I do not speak; they are, or ought to be, in a position to help themselves without seeking Government aid, which at present is limited, and should be reserved, as I have pointed out, for their poorer brethren. I would point out a grievous mistake made by many farmers, in keeping their stallions perpetually shut up. No animal can exercise his proper functions when not sufficiently exercised; and yet I have seen horses kept shut up in a dark stable and never let out, except when they covered mares, from week's end to week's end, deformed feet and a state of obesity more fit for a prize bullock than a horse being the result.

If the Indian or Imperial Government intends to obtain remounts from South Africa, it will be absolutely necessary to purchase them on the spot, at all events for some time to come, as in the present state of things it would be simply impossible to get any one to buy and bring them to Calcutta, as the Australian dealers do. Few people have the capital, and the natural apathy of the Dutch population would prevent their trusting their animals to an agent for sale in such, to them, an unknown country as India. In the event of this being done a farm should be obtained to form a depôt in which the horses could be kept until a cargo for shipment was ready, as they would have to be picked up about the country. I would recommend somewhere in the Western District, on the sea-coast to the north, in the vicinity of Saldhana Bay, or Malmsbury, as a suitable spot. The reason I suggest this locality is that Cape Town is really the only port in the Colony where young unbroken horses could be shipped with safety, the docks giving accommodation for large ships alongside the quay. All the other ports—East London, Port Elizabeth, Port Alfred, and Durban—are open roadsteads, in which ships lie in the offing, and cargo is brought off in lighters. I need hardly point out the risks, expense, and trouble that this would occur with young animals, especially in bad weather. In fact, when the wind is blowing from the south, which it sometimes does for days together, shipment would be impossible, leaving out all risks of accidents; while the cost of demurrage of transport ships and

delay of animals at the port would be very great, and for this reason alone the depôt should be near Cape Town. Another reason is that the Malmsbury district and thereabouts is the centre of the grain-growing district of the Cape, and oat hay, which is what horses are fed on in South Africa, is much cheaper there. A third, and a very weighty reason is that this part is never visited by Horse-sickness, from reasons that I have given in my report on the nature and causes of that disease in Natal. The drawback to this locality is that down on the sea-coast, at all events, there is a scarcity of water; but inland, being watered by the Burg River, this is not the case. The distance from Cape Town is not very great, the town of Malmsbury being, as the crow flies, about forty miles, and this distance could easily be travelled by horses when a cargo was ready for shipment. This is merely a rough outline of a remount depôt; and I have not gone further into the matter, as I do not think that such an establishment will ever be formed, neither do I think it would be justified so long as private individuals will import horses at their own risk into India and sell them there; and even were the Indian Government willing to incur the expense, the money would be better laid out in Australia, where horses are, than in South Africa, where it will be a matter of some years before they can be obtained in quantities. In the case of the Imperial Government, I consider that any money expended for this purpose would be very much better employed in encouraging horse-breeding at home, as in Ireland or Yorkshire. As such an establishment would at present be absolutely necessary in order to procure remounts from South Africa—for, as I have before said, I do not think any dealer or private individual in the country would ship horses to India at his own risk, as the Australians do—and as it would altogether be for the benefit and convenience of the Colony, I think that in the event of its being formed it should be paid for by the Colonial Government, otherwise it would be giving an unfair advantage to South Africa over Australia and New Zealand.

In saying that no one would ship horses at his own risk from South Africa I do so advisedly, for a cargo of horses, about 150 in number, was shipped from Port Elizabeth in the s.s. *Clan Gordon* for Calcutta, in the month of November, by a private individual. I did not, unfortunately, see them myself, as I did not hear of the matter until too late, and I was at the time away in a remote part of the country; but from what I can gather, they were inferior animals, and should by no means be taken as representative types of what, even at present, can be found in the Colony.

Although the Cape horse has fallen off, I cannot speak too highly of the mules, and if horse-breeding had been as carefully attended to there would be but little to complain of. Some of the teams bringing loads of forage into Cape Town are magnificent animals, standing 14·2 hands or thereabouts. I could not find out that any particular donkey stallion is used, although I saw several Spanish ones; but the country donkeys are fine animals, and I suspect that they have a strong strain of Arab or Persian blood in them, that has filtered down from the Mohammedan country about Zanzibar and Eastern Africa. In the event of any attempt being made at improvement, I would suggest that the black Neapolitan donkey be tried. There were a number of them in the horse-breeding operations in the Punjaub, and they turned out a great success; but the Indian type of mule is different from the South African, being used for pack, not for draught purposes; in fact, the difficulty out there was to breed them small enough. Although I do not think that at present many Cavalry remounts could be obtained from the Cape, and the farmers say that horse-breeding does not pay them, still there is no reason why, if properly gone about, it should not. Undoubtedly, there is no demand for the inferior light breeds that swarm over the country. It would be a wonder if there were; but for a superior class of animal, that would compete with the Australians, there is at

present more than a sufficient demand in the Colony itself. A gentleman in Cape Town told me that he wanted a pair of harness-horses, 15·3 high, to draw a big barouche, and was willing to pay about £100. He was not very particular, and he had been more than six months looking for them, and could not find them. Another, at Kimberley, wanted a horse up to thirteen stone to carry him out coursing, and although willing to pay £60, or £70, could not find one. I could cite numerous other instances of people who have asked me in the course of my travels to try and find really first-class horses for them, price being no object; so this shows there is still a market open.

If the discoveries of gold in the Transvaal and elsewhere continue—and there is every likelihood of their doing so—the demand for horses will increase, and the Colony is the place it should be supplied from; and as at present feathers, wool, mohair, and grain are at a very low price, I do not see why horse-breeding, if properly conducted on ordinary common-sense principles, should not be a paying concern; so that, far from having to send to Calcutta, Madras, and elsewhere to find a market, there is a ready sale, which will increase, for good animals in the Colony itself. One thing is certain, that if it is worth while keeping up the herds of inferior animals I have seen on some farms, it would be more worth improving them, for it costs no more to breed a good foal than a bad one, and I maintain that it would pay better to keep five good mares and foals, and look after them, than twenty of an inferior sort.

In this report I have not made any mention of the horses of the Orange Free State and Natal, as although I have been some months in the latter Colony, my experiments and researches into the nature of South African Horse-sickness, particularly the bacteriology of it, have occupied all my time; and as you know, bacteriological work requires unremitting care and attention, and I have hardly been able to leave the town of Pietermaritzburg I trust, however, before I leave the Colony, to have an opportunity of visiting the Orange Free State, especially the Harrismith District, and, if so, will submit a supplementary report to you.

In the foregoing remarks I have confined myself to the class of horse from which remounts for Heavy and Medium Cavalry could be obtained. For Mounted Infantry, Mounted Rifles, and other such-like corps plenty of good servicable cobs and ponies, 14 to 14·2, can be obtained, especially in Basutoland, and it was for the purpose of seeing this class of animal that I visited that country.

Of the endurance and activity of these animals I cannot speak too highly. They seldom or ever get anything more than they can pick up on the Veldt, and yet they commonly do journeys of 60 and 80 miles in the day, and this they will do carrying 13 or 14 stone. They are wonderfully sound, and are seldom if ever shod, although some of the tracks and paths are very stony and rough. A peculiarity of the Basutos is that they will rarely sell a young horse, all that I saw for sale being aged. The reason of this is that they are running loose on the mountains, and are not caught till seven or eight, their ages being reckoned from the day they begin to work.

Without any intention of fraud, I have had ponies said to be three and four years old brought to me that really were eight or ten, the owner counting from the date he began to work them. It really does not much matter if these ponies are aged, as they will work for years. A peculiarity I noticed is that by the marks of the teeth between six and eight years they showed to be younger than they really are, the teeth being worn down. I attribute this to the quantity of sand that is in the grass, and the rough nature of the herbage they have to tear off the ground.

The matter of the cost of transport to India and England, and the price horses could be obtained for, I have not given in this report. I have been

promised some returns and statistics that have not yet come to hand, but when they do, which I hope will be in a few days, I will submit them in a separate report.

I trust that this report will be taken in good part, as in places I have not painted things in very glowing colours; but as the instructions I received were to inquire into the horse question of South Africa generally, it would have been useless not to have pointed out where faults lay and mistakes are made, or by passing lightly over them.

That horses could be bred in South Africa as good as in any part of the world, I have not the slightest doubt. In fact, it is not a problem that requires much demonstration, for they were so once, and why should they not again? If they are not, it will not be the country or the climate that is to blame; and even as it is, as I have said before, there are good, suitable horses in the country, and in times of emergency a certain number could be obtained.

In conclusion, I must convey my thanks to all officials and others I had to come in contact with, for their efforts to forward this inquiry by every means in their power, and particularly to D. Hutcheon, Esq., Colonial Veterinary Surgeon, who accompanied me round the Midland District, and by his advice and knowledge of the country I obtained information which I otherwise should not have got.

HORSES REQUIRED FOR THE INDIAN ARMY.*

By J. H. B. Hallen, M.R.C.S., M.R.C.V.S., General Superintendent, Horse-Breeding Department.

The several classes of horses required for the Indian Army are as follows:—

Horse Artillery.
Field Artillery.
British Cavalry.
Native Cavalry.

2. The horses for the Artillery and British Cavalry are the property of the State, and are mostly obtained from Australia, the Persian Gulf, and the Cape of Good Hope. A few bred and reared in India are also bought for these branches of the service.

3. The organisation of the Bengal and Punjab Native Cavalry is on the Silladar system and the men are mounted on Indian-bred horses, and a few of foreign breeds; these are the property of the men of the regiments, not of Government.

4. The Madras Native Cavalry are mounted by the State on horses from the Persian Gulf and Northern India, and some Indian-bred horses. The Bombay Native Cavalry are on the Silladar system, and the horses are the property of the men of the several regiments; these mostly come from the Persian Gulf, but there are also a few of country-bred stock.

5. The stamp of horses required for the different branches as above noted may be described as follows:—

For Horse Artillery.—Well-bred large-jointed, good-limbed, active horses, from 15 hands 1 inch to 16 hands 1 inch in height.

For Field Artillery.—A similar stamp of horse, but of a more powerful build, yet well bred, though not necessarily showing so much action and speed as the Horse Artillery horse.

For British Cavalry.—Well-bred hunter or hackney-like horse, from 15 to

* A lecture delivered at a meeting at Simla, on August 25th, the Commander-in-Chief, Sir Frederick Roberts, in the Chair.

15 hands 3 inches, possessing good shoulders and action, with strong back, loins, and chest, large-sized bone of joints and limbs, and able to carry a heavy weight, and to move rapidly under that weight over ordinary cross-country ground.

For Native Cavalry.—Much the same stamp of horse as that described for British Cavalry, but of smaller dimensions and build, well-bred, from 14 hands 1 inch to 15 hands 1 inch in height, and possessing much activity.

6. It may be in all truth stated that the Indian Artillery and Cavalry are remarkably well horsed; indeed, it may be added that their horses will compare favourably, if not excel, the horses in any other army in the world, as being fit and able to do their work in all extremes of climate from the temperature of tropical heat to that of freezing point. They have been tested in late campaigns, and results justifying the statement now recorded.

7. But the weak points of the remounting of the Indian armies consist in the present system of importing the greater part of the horses from other countries above noted for the requirements of British Cavalry and Artillery, and Madras and Bombay Native Cavalry.

8. It is evident that for political reasons, all the horses required for war purposes should be obtainable within Indian limits, and on financial and revenue grounds the money spent in purchasing the horses should be distributed among the agriculturists and horse breeders of India, and thus the encouraging, fostering, and developing of horse breeding as an agricultural industry would be in a marked and practical manner fully carried out.

9. The Bengal Stud Department which existed from 1794 to 1876, and the Bombay Stud Department, which was in force a few years (between 1830 and 1842, I believe) failed to supply the number and stamp of horses required for the army, and the present Horse Breeding Department does not yield a sufficient number of horses for army wants, beyond supplying an improved stamp for Bengal and Punjab Native Cavalry, and as yet only a few for British Cavalry and Artillery.

10. The principles laid down for the working of the Horse Breeding Department, when it was inaugurated in 1876, by the Imperial Government, were described by me in a paper I had the honour of reading at this Institution in May, 1887.

11. Briefly, I will here recapitulate that the Government supplies the best stallions available, and of breeds considered suitable for country-bred mares, the property of agriculturists in the North-Western Provinces, Punjab and Bombay horse breeding districts. The mares have to be inspected by the veterinary surgeons, who form the *personnel* of the Department, and those mares approved are branded in proof of their being pronounced eligible for being mated with the Government sires. No covering fees are levied, and no lien on the produce is held by the Government; but the brand denotes that a promise is made by Government that the services of Government stallions should be available for the mares, and the owners on their part agree to bring their branded mares to Government sires. In addition the Imperial Government grant annually Rs. 20,000 in prizes at horse fairs and shows for the best of stock got by Government stallions out of branded mares; and at some of these exhibitions additional awards are provided from moneys locally subscribed.

12. Government purchase the produce in the open market like any ordinary buyer.

13. The result, after twelve years' experience of the working of the Department, is that the stamp generally of horse stock in Northern India has much improved, and the Bengal and Punjab Native Cavalry are now mounted on superior horses which have done work in a satisfactory manner, also that the

few country-bred horses now in the ranks of British Cavalry and Artillery are favourably reported on.

14. The numbers required for Native Cavalry, in Northern India, and Mounted Police are obtainable in the districts and markets; but the number purchased for British services are so limited as to necessitate the purchasing of Australian and Persian Gulf horses, also during the past year a few Cape horses, to remount those branches of the service.

15. It will be now as well to give the number of horses required on the average annually for the several services of the different armies in India, and the numbers may be accepted in the aggregate, as follows:—

For Horse Artillery	.. ..	232
„ Field do.	.. ..	248
„ British Cavalry	.. ..	462
„ Bengal and Punjab Native Cavalry	.. ..	1,200
„ Madras Native Cavalry	.. ..	282
„ Bombay Native Cavalry	.. ..	400
Total	.. ..	2,824

16. The requirements of remounts for the levies of native states are not precisely known, but may be noted as considerable, inasmuch as agents from the states are to be found at every horse fair and show. Moreover, European and native dealers are regular purchasers of horse stock at all ages, and at prices from the highest to the lowest figures of each, at all fairs and shows and in breeding districts. The animals so purchased are re-sold in all parts of India, at Calcutta, and in most large stations.

17. The demand is greater than the supply, and the improvement of the classes of the stock in Government breeding districts has caused native states to seek for most of the horses they require in those districts, as horse breeding in their own states remains limited, and not equal to affording sufficient produce for their own wants.

18. The number of stallions allowed by the Imperial Government in Northern India is limited to 300, and the registered number of approved and branded mares was on the 31st March last 14,827.

19. In the Bombay Presidency there are at present 103 horse and pony stallions—59 horse, and 44 pony—and of branded mares 4,761 for horse and 5,212 for pony stallions. Of the branded horse mares in India, viz., 19,588, it may be proximately taken one-half visit the stallions annually, and of these say one half yield produce, thus it may be calculated that 4,184 young horse stock are born annually; and of these probably 600 do not reach maturity, so about 3,584 may be considered as the probable number of country-bred horse stock by Government stallions available in the annual Indian markets. Of these we have evidence that about 1,500 are purchased chiefly by the Native Cavalry of the Indian Army, leaving a balance of 2,084 absorbed by the Government police, native states, and the general public.

20. As the supply is not found equal to the demand for the British Cavalry and Artillery, and Madras and Bombay Native Cavalry, the inference is that there is ample room for the extension of horse breeding, and to effect this a greater number of sires and dams are required. The latter will probably become available in proportion to the number of sires at hand; and these should be of a class and stamp found by practical experience most suitable for producing useful stock, and of the kind that will realise a good price, a paying price to the breeder and rearer. If breeding be proved remunerative it will surely develop.

21. As the Government may be considered to be the largest purchaser in

the market, and as a rule, but not always, may be said to give the highest prices, so will it be as well to briefly refer again to the description of the several kinds of horses above shown as required for the army, and they may be summarily described to be as follows:—

For horse artillery, powerful, well-bred, large-jointed, good-boned and limbed; to measure not less than 8 inches under the knee, from 15 hands to 16 hands 1 inch in height, able to carry 15 stone, and draw 6½ to 8½ cwts.; to have good action and speed, and to weigh from 8 to 10 cwts.

For field artillery and ammunition columns, horses of a similar stamp and height as those required for horse artillery; but of greater power and larger bone, though not so active and speedy, and of weight from 9 to 10 cwts.

For British cavalry, the hunter-like, cross-country horse type, well bred and with good action, powerful in back and loins, and large enough in bone of joints and leg to carry from 17 to 18 stone across country; in height to be from 15 hands to 15 hands 3 inches, to measure not less than 8 inches under the knee, and to be not less than 8½ cwts. in weight.

For native cavalry, of a similar class as that described for British cavalry, and capable of similar work, carrying from 15 to 16 stone, to measure from 7½ to 8 inches under the knee; in height from 14 hands 1 inch upwards, and in weight from 7 to 8 cwts.

22. As we desire to obtain the above classes of army horses from the indigenous and improved mares found in the Indian breeding districts, a description of these mares is requisite.

23. The majority of country-bred mares of India may be said to range in height from 13 hands 2 inches to 14 hands 2 inches, and some few are found as high as 15 hands, and in weight from 6 to 8 cwts.

24. They are as a rule remarkably well bred, rather light in barrel, not evenly put together, often of an angular and ragged appearance, with small but steel-like bone of joints and limbs, measuring from 6¼ to 7¼ inches under the knee, at the top of the shank bone. They have wonderful powers of endurance under either tropical sun heat or intense cold; with a light weight say from 10 to 12 stones in saddle, or light draught; and after the hardest day's work are never off their feed, but always ready for it; moreover, they will continue doing work on the scantiest of food.

25. In the improved breeds obtained from these mares by Government sires, we have increased size in bulk and more bone of limbs, greater weight carrying and draught power, and still we find the powers of endurance equal to army service work.

26. We have therefore in the indigenous and improved mares a grand structure for engrafting more power and size. Indeed, we could not desire a more suitable basis to work on, in improving the breed so as to render the produce from it more generally suited for greater weight carrying and pulling powers.

27. The important question is how to carry out this alteration and development in conformation, size, and power by a safe and practical mode of action; *i.e.*, we desire to obtain larger and more powerful stock from this under-sized, but in every other respect, as regards general utility work, high bred and lasting tropical horse stock.

28. Granted, if we kept the breed intact, by liberal feeding we could gradually obtain development in size and power; but this would require generations to effect, and more time to bring about the even conformation found associated with improved types.

29. The axiom that the sire has more influence in the production of outward conformation and limbs, and the mares in creating the vital organs of the produce is proved sound daily in horse and mule-breeding in India.

It may therefore be accepted that the using of sires able to impart to the

stock of country mares more substance and size without appreciable loss of enduring powers is the only plan to adopt with the view of creating in India a larger and still well-bred and more powerful and "general utility" horse.

30. This change in conformation of body and limb must not be expected in one or even two generations, but should be carried out gradually, by using at first a stallion not too large or weighty compared to the mare, and at every succeeding generation of enlarged mare stock, using horses of larger bulk. I am inclined to believe it better for the dam to be larger, more bulky than the sire, but I have to make recommendations how to act with dams smaller than the stallions.

31. In time, by judicious mating with development therefrom, we may in India secure dam stock of a size to allow of it being served by stallions of smaller dimensions. Again, the stallions employed must be pure of breed, of good constitutions, hardy, and devoid of hereditary diseases of limbs.

(*To be continued.*)

Reviews.

A Text-book of Physiology. Vol. I. By J. G. McKendrick, M.D., LL.D., F.R.S. (Glasgow: James Maclehose and Sons. 1888.)

Physiology is making such rapid advances that, in order to keep up with its developments, the practitioner of medicine, human or animal, must either peruse in a regular and constant manner the periodicals specially devoted to a record of these, or provide himself at brief intervals with one of the new text-books, or new editions of those already existing, with which we are favoured by the best authorities on the subject. It is, we hope, needless to dwell on the importance of this fascinating science to successful medical practice; it is nowadays all-important, for without it no satisfactory progress can be made in the knowledge of morbid processes or clinical medicine. To the veterinary surgeon it would seem to be even more necessary than it is to the surgeon or physician of mankind, and the more thoroughly he comprehends the principles and facts which the physiologist lays before him, so the more profitable to himself and his patients—not to mention the owners of these—will be his services.

For the student, anatomy and physiology constitute the foundation of his studies, surgical, pathological, and therapeutical knowledge being built upon them; and the more widely and firmly the foundation is laid, so the more serviceable and durable will be the superstructure.

Though only the first volume of Dr. McKendrick's work is as yet issued, we are satisfied that, when completed, no better book on the subject could be in the hands of the veterinary practitioner or student. The author occupies the highest position as a physiologist and a lecturer on that science, which he represents in the University of Glasgow. We may also add, as an additional recommendation to his reception by the profession, if such be necessary, that he was for some time lecturer on physiology at the Dick College, Edinburgh, and he is now an examiner on this subject for the Royal College of Veterinary Surgeons.

The book gives what was promised, an account of methods and

results; and so far as general physiology is concerned—and beyond which the present volume does not carry us—the account is complete, clear, and most instructive, as it gives us the main facts and principles of physiology in a very attractive form, morphologically, chemically, and physically. We shall look out for the appearance of the second volume with much interest, as we anticipate the author's handling of the special physiology of organs will be all that can be desired. For the present volume we have nothing but praise and commendation, text and illustrations being alike admirable.

HYDROPHOBIA: A REVIEW OF PASTEUR'S TREATMENT. By W. COLLIER, M.A., M.D., Cantab., M.R.C.P. (London: H. K. Lewis. 1888.)

In a pamphlet of thirty-one pages Dr. Collier deals in a summary manner with the most salient of Pasteur's discoveries, more than one half of the number of pages being devoted to the great Frenchman's protective and preventive treatment of Rabies, so familiar to our readers. The author is a believer in the efficacy of this treatment, and in concluding his remarks he asks the question as to how the failures to prevent the appearance of the disease in those who have been inoculated, can be accounted for.

His reply is as follows: "When we remember that many of Pasteur's patients have presented themselves for treatment several weeks after being bitten we cannot be surprised that in some cases his treatment has failed, for in such cases we should expect the original poison to have developed to such an extent as to be uninfluenced by any subsequent treatment. Our experience of Small-pox throws some light on this point, there being very strong evidence to prove that it is possible to avert or modify Small-pox by vaccinating those very recently exposed to its infection, while if vaccination be delayed beyond two or three days from infection the course of the disease is unaltered. Again, experience teaches that a child occasionally has Small-pox very severely, and even fatally, after vaccination, yet this does not prove that vaccination is altogether useless. We must not forget that during the course of his treatment Pasteur inoculates his patients with impunity with a poison which, when inoculated into the body of an ordinary healthy unprepared dog or rabbit, with absolute certainty gives rise to all the usual symptoms of Rabies, and kills it in a few days, and which we have no reason whatever to doubt would give rise to Hydrophobia in man had the system not been prepared to resist the poison by the previous inoculation of weaker and less potent virus. The opponents of the treatment must give some reasonable explanation of this fact.

ANATOMICAL OUTLINES OF THE HORSE. By J. A. MCBRIDE, Ph.D., M.R.C.V.S. Third Edition. (Cirencester: Baily and Son. 1888.)

The third edition of this little book does not call for any special remarks. Elementary in its character, simple and correct in description, and neatly got up, its success is evidenced by the demand for it by, we presume, agricultural students. For such it should be very suitable.

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

MEETING OF COUNCIL HELD OCTOBER 11TH, 1888.

Professor PRITCHARD, President, in the chair.

Present:—Professors Axe, Brown, C.B., Duguid, Pritchard, Walley, and Williams; Dr. Fleming, C.B., and Sir H. Simpson; Messrs. Briggs, Campbell, Cartledge, Dray, Greaves, Mulvey, J. F. Simpson, Stephenson, P. Taylor, Wilson, Whittle, Woods, Wragg, and the Secretary.

The SECRETARY read a letter which had just been received by the President from Mr. William Hunting, the editor of a professional journal, asking permission for his representative to be present to report the proceedings.

Professor WILLIAMS proposed "That the request be granted."

Mr. MULVEY seconded the motion, which, after a short discussion, was carried.

The SECRETARY read the notice convening the meeting.

Professor WALLEY wished, before the minutes were read, to protest against the circular containing a proposal by Mr. Briggs that Mr. G. G. Mayor, F.R.C.V.S., be appointed Examiner in Botany. That was a most unusual proceeding. It ought simply to be "That an Examiner in Botany in succession to Professor Macqueen be appointed."

The PRESIDENT said he did not think there was anything in the Bye-laws or the Charters to prevent such a notice.

Mr. BRIGGS said he simply gave the Secretary notice that he should propose Mr. Mayor. He did not ask that it should be put in the notice of meeting.

Mr. P. TAYLOR proposed "That the minutes be taken as read."

Sir HENRY SIMPSON said that on the last occasion a resolution was passed by the Council to the effect that a list of the committees and of the members of the Council should be printed and circulated amongst the members of the Council and the presidents of the various medical societies, but nearly three months had elapsed and that useful information had not been furnished to the members of the Council. Another resolution, passed at the last meeting, was to the effect that the College would undertake the duties requested by the Royal Agricultural Society and the Royal Commission on Horse Breeding; but he had recently learned, with very great surprise, that no official communication from the College had reached the Council of the Royal Agricultural Society in time for their meeting in August. Another important fact was that, although the Council had pledged themselves to perform the duty, nothing had been done in that direction down to the present time. He trusted that the President would be able to remove the impression that time had been wasted. He also wished to know if any steps had been taken to carry out the resolution that representation should be made to the Lords of the Council that prosecutions were about to be instituted by the College, and asking them to afford facilities for obtaining the penalties derivable from such prosecutions. The minutes of the last meeting were conspicuous by very important omissions.

The PRESIDENT said the resolution said that the list of committees should be circulated.

Sir HENRY SIMPSON said it was that the list be printed and circulated "as last year," with a list of the members of the Council. Last year they were distributed to all members of the Council, and to the presidents of the medical societies, and the resolution then passed was that they should be printed and circulated annually, so that there was no occasion for the matter to be brought forward this year.

Mr. DRAY asked whether the appointment of Professor Brown as Examiner was in harmony with the Charters.

Dr. FLEMING said that of course the Charters and the Bye-laws regulated the business of the Council.

Sir HENRY SIMPSON said that, on looking into the Charter, he was so satisfied that the matter was all right that he did not take any further trouble about it, and consulted nobody about it. He felt quite sure that the appointment was perfectly legal. On pages 25 and 26 of the original Charter there were regulations according to which a professor might not be an Examiner; but the words said that he should not be a teacher of any student who came up for examination, and applied entirely to membership and not to fellowship.

The SECRETARY said he had found the passage in the shorthand transcript, and the words "as last year" were not there.

The SHORTHAND WRITER referred to his notes, which showed that the words "as last year" were used, although they did not appear in the transcript sent in to the Council.

Sir HENRY SIMPSON asked that some information might be given as to why no letter had been sent acknowledging the communication from the Royal Agricultural Society.

The PRESIDENT said that, as most of the members of Council were out of town, he thought that it would hardly be possible to hold a meeting. The question was so important that he thought the whole Council should deal with it, and he doubted whether even they would be able to deal with it without outside assistance. He did not think that much valuable time had been lost, and he was as anxious to get the matter settled as anybody could be.

Sir HENRY SIMPSON asked if anything had been done with regard to the resolution proposed by Dr. Fleming, and seconded by Professor Walley, that steps be taken to represent to the Lords of the Privy Council the position of the College with respect to prosecutions.

The PRESIDENT said nothing had been done up to the present.

The minutes were then adopted and signed.

Correspondence.

The SECRETARY read letters, regretting their inability to attend the meeting, from Messrs. McCall, Carter, and Simcox.

A letter was read from Mr. James Yates, a registered practitioner, enclosing a guinea subscription in aid of the "Royal Veterinary College."

The SECRETARY was instructed to write to Mr. Yates informing him that the College Fund was closed.

A letter was read from Messrs. Kelly in reference to a circular they had issued in connection with the publication of a "Directory of Chemists, Druggists, etc., in England, Scotland, and Wales." Under the list of trades comprised in that work were included veterinary surgeons.

Presentations to the Library.

A photograph of the Bombay Veterinary College, presented by Mr. Steele; also two pamphlets in the Canarese and Mahratta languages, of his Primer on Cattle Disease, and his *Quarterly Journal of Veterinary Science in India*; two books written by Mr. Frank S. Billings, one on "Cattle Plague and Yellow Fever," and the other on "Swine Plague," presented by Mr. Banham.

On the motion of Mr. WHITTLE, seconded by Mr. P. TAYLOR, a vote of thanks was passed to the respective donors.

Finance Committee.

Mr. DRAY moved that the report of the Finance Committee be received.

Mr. P. TAYLOR seconded the motion.

The SECRETARY read the report, and announced that he had received a

letter asking if the Royal Veterinary Association might hold their meeting in the College next Monday.

Mr. WRAGG moved that the National Veterinary Association be allowed the use of the Council Chamber for their next annual meeting, and that the Provisional Committee be allowed the use of the committee-room for their several meetings between now and the annual meeting, and that no charge be made to the Royal Counties for the use of the committee-room some days ago.

Mr. MULVEY seconded the motion.

Professor WALLEY said that four years ago a resolution was passed to make a charge.

Mr. WRAGG said he would propose to rescind that resolution.

Sir HENRY SIMPSON said notice must be given of such a motion.

Mr. WRAGG said the meeting of the Royal Counties would not have been held in the College if it had been thought that any charge would be made.

Professor AXE gave notice of a motion to rescind the resolution, leaving it to the discretion of the Council from time to time to charge or not, as they thought fit.

The report of the Finance Committee was thereupon adopted.

On the motion of Dr. FLEMING, seconded by Mr. WILSON, the question of charging for the use of the rooms was deferred till next meeting.

The SECRETARY read the report of the Registration Committee, which, on the motion of Mr. DRAY, seconded by Mr. P. TAYLOR, was received and adopted.

Sir HENRY SIMPSON proposed "That the question of the duties, salaries, and allowances of the Secretaries of the College be referred to a committee, consisting of the President and the past Presidents, who at the present time are members of Council." He said he proposed the Presidents and past Presidents because they would be more likely to be acquainted with the secretarial work than others. There were ten past Presidents, so that the committee would be quite large enough. The Secretary for Scotland, whose salary was £50, had said to him, "I think the duties of the post should be well defined; for, although I know how to do everything, the time may come when it will be desirable to have a regular course laid down, particularly with regard to the handling of the Royal College money." There could be no doubt that from time to time it was desirable to look into the question of salaries, allowances, and duties. At the present time the Secretary's remuneration was on an unsatisfactory footing. He was paid partly for his services and partly for the rent of the house. Mr. Cox had given notice of a motion giving the Secretary charge of the books, and that question also might be dealt with by the proposed committee, who would report to the Council at the next meeting.

Mr. WOODS seconded the motion. The resolution was carried.

Sir HENRY SIMPSON withdrew the other motion standing in his name on the notice paper, with reference to the Fitzwygram prizes.

Election of an Examiner.

Mr. BRIGGS proposed that Mr. G. G. Mayor, F.R.C.V.S., of Kirkham, Lancashire, be appointed an Examiner in Botany in the place of Professor Macqueen, resigned. Mr. Mayor, he said, obtained during his College career Dr. Covell's prize for Botany.

Professor BROWN proposed the appointment of Professor Almond, Professor of Veterinary Surgery at the Royal College, Cirencester.

Professor WILLIAMS proposed the appointment of Mr. Hutton, of Kelso.

Professor AXE proposed the appointment of Mr. Richard Poyser, of the Army Veterinary Department.

A ballot being taken, the result of the voting was: For Professor Almond, 11; for Mr. Hutton, 5; for Mr. Poyser, 2; for Mr. Mayor, 1.

The PRESIDENT declared the election to have fallen upon Professor Almond.

Committee on Defects in Horses for Breeding Purposes.

Professor WALLEY proposed that this Committee should consist of the whole of the Council, and all members of the profession who had at any time acted as veterinary surgeons to agricultural societies or horse-breeding societies.

Professor AXE considered it imperatively necessary that the Council should seek extraneous aid in order to prepare a report. It appeared to him that a committee should be appointed to seek for evidence of hereditary influence, in connection with societies for breeding stock. Whatever the report said must be based on matter of fact, and not on the opinions of individuals.

Mr. WILSON was prepared to second a resolution "That a committee of the whole Council be formed to take this question into consideration, with power to add to their numbers."

Professor WALLEY said he was quite willing to alter his motion in accordance with Mr. Wilson's suggestion.

Dr. FLEMING said his experience was that the smaller the committee the greater likelihood there was of having the work satisfactorily done. There could not be a doubt that very much of what was considered hereditary tendency to disease was traditional. A small committee should be empowered to gather evidence upon which to base an opinion.

Mr. CARTLEDGE considered that evidence might be collected without putting on the committee anyone outside the profession.

Mr. J. SIMPSON thought the whole Council should be the Committee of Inquiry, with power to invite not only veterinary surgeons but breeders to give evidence. He should be opposed to outsiders being on the committee.

Sir HENRY SIMPSON thought the best plan would be to adopt Professor Walley's motion. There was no reason why the committee so nominated should not meet within a week.

Professor BROWN said that what the Council had been asked to do was not to appoint themselves a committee or to take evidence, but to call a conference of members of the profession for the purpose of discussing the matter. The whole question was a very large one, and not to be lightly dealt with. Unless a conference was called at which every member of the profession would have a right to attend and express his opinion, the Council would not perform the work which they had been asked to do.

Professor WILLIAMS said he would propose that a small committee be formed to collect evidence to be afterwards considered by the Council, who should, if thought desirable, summon a conference of the profession.

Mr. WHITTLE seconded the motion.

Mr. J. SIMPSON said it was impossible to ascertain from a speaker at a public meeting what his experience had been, and consequently what value should be attached to his evidence.

The PRESIDENT said there could be no doubt that the Council had been asked to call a conference of the members of the profession, but it would be necessary to have a committee to handle the conference.

Professor BROWN thought if a committee was appointed, the simple thing would be to instruct them to take steps to summon a conference of members of the profession. If the Council could report to the Royal Agricultural Society and the Horse Commission that some such steps had been taken they would be perfectly satisfied, but they expected to hear something from the Council at their meeting in November.

Dr. FLEMING considered that the meaning of the word "conference" would be met by sending out circulars with questions.

Professor BROWN said that in that case the committee might have instructions to prepare the questions.

The other motions having been withdrawn, it was agreed, on the motion of Professor WILLIAMS, seconded by Mr. WHITTLE, "That a small committee be formed to draw up a series of questions to be submitted to the profession, the answers to be afterwards laid before the Council, who shall, if they think fit, further confer with the members of the profession."

On the motion of Mr. J. SIMPSON, seconded by Professor WILLIAMS, it was resolved that the committee consist of six members.

A ballot was taken for the election of the committee, and the result was as follows:—Professor Williams, 14; Professor Brown, 14; Professor Walley, 10; Sir Henry Simpson, 10; Professor Axe, 8; Mr. Stephenson, 8; Dr. Fleming, 7; Mr. Cartledge, 5; Professor Duguid, 4; Mr. Campbell, 3; Mr. Wragg, 1; Mr. Woods, 1.

The first six were declared duly elected.

SPECIAL MEETING.

Mr. WRAGG said he had received a letter from the solicitor to the Council, who informed him that his proposed motion should be connected with Bye-law No. 3. He would therefore give notice of his intention to move: "Fifteen days prior to the Annual General Meeting, held on the first Monday in the month of May, the Secretary shall prepare a list stating the names in alphabetical order and residence of the persons proposed, with the names of one proposer only for each candidate."

Mr. J. ROALFE COX not being present to propose the "amendments or additions to existing Bye-laws" standing in his name,

Mr. WRAGG gave notice of the same in his own name.

It was agreed that the Scotch Christmas examinations should commence on Thursday, December 13th.

A hearty vote of thanks was accorded to the President.

ROYAL VETERINARY COLLEGE.

DR. FLEMING, C.B., presided at the opening of the winter session at the Royal Veterinary College, Camden Town, on October 1st. There was a large attendance of visitors and students.

In opening the proceedings, Dr. FLEMING said:—Gentlemen, I have been deputed by the Governors of this Institution to preside at the opening meeting of the School. I need not say I regret the duty has not fallen to one of the distinguished noblemen who take such a lively interest in the Institution, but the business is more a formal matter than anything else, therefore I have very much pleasure in presiding here to-day, and without further preface I will call upon the Principal of the School to deliver the Introductory Lecture. (Cheers.)

Professor BROWN, who was received with cheers, said:

DR. FLEMING AND GENTLEMEN,—An inaugural address is always more or less embarrassing, mainly on account of the remarkable number and importance of the subjects which force themselves forward for consideration. Emphatically this age is one of inquiry. The dogmatic system of the Old School has given place to a system of doubt. We have no longer the definite action of the old physician, but rather the hesitant and expectant or tentative system of treatment which belongs to the new. If you look back upon the time when the mediæval medicine man was half astrologer and half doctor, and compare him with the modern physician, you cannot possibly fail to be struck with the extraordinary dissimilarity. The old doctor was more concerned with his patient's horoscope than with the use of the stethoscope, and

far more anxious to ascertain under what special condition of the planets the person who consulted him was born than he was to find out the particular condition of his excretory and secretory organs.

Having discovered what he wished to find, the doctor had no longer any hesitation. He triturated his powders at certain phases of the moon, and he distilled his potions with various ceremonies partaking of the nature of incantations, and then, having decided exactly what the afflicting humours were in his patient's system, he gave his directions which, if implicitly obeyed, must, he affirmed, lead to the desired result. Whether he believed in himself may be a matter that is open to some question, but that the people believed in him with a reverence that amounted almost to superstition is a fact which stands plainly written on the page of ancient medical history.

Compare the picture of the ancient with that of the modern physician as we see him now by the bedside of his patient who is suffering from some form of specific fever; his diagnosis may be thus expressed. The heat-producing, or heat-regulating functions are out of order, some poison in the blood is the cause of this disturbing derangement; he affirms that this poison must be carefully and judiciously eliminated; he enjoins absolute quiet, free ventilation, and the use of disinfection. If he prescribes medicine at all, it is of the most simple character. He takes the patient's temperature every morning and evening for the purpose of constructing a thermometrical chart. Treatment beyond this the highest authorities as a rule will not attempt. With a firm faith in the reparative power of the system, and a singular disbelief in the efficacy of specific agents, they are content to trust the patient to nature rather than interfere where interference might possibly be disastrous. It may be, and indeed constantly is, the case that there is some question as to what ought to be done, and under these circumstances the most accomplished of our medical practitioners will without hesitation decide to do nothing. Not to interfere with the progress of a specific disease is a maxim of the medical science of the day which no one dreams of disputing.

While, however, the *ars medicinæ* has adopted a retiring attitude and seems bent on a policy of self-effacement, surgery has made a stride forward to the front. Nothing now is hidden from the surgeon's knife. You may bury a tumour deep in the convolutions of the brain, hide it in the midst of the spinal cord, and cover it with ganglia, its detection and removal is a mere graceful exercise of the mind and hand of the accomplished surgeon. (Cheers.) One of our great art critics has said of the accomplished painter that his brush moves within a thousandth of an inch, and that no touch can be wantonly or wastefully made without marring the work. What is this to the thin line of glancing steel in the hand of the accomplished surgeon as he wanders amidst structures to touch which is death to the patient on whom he is operating? The transforming power of the surgeon's knife at the present day equals or surpasses that of the wand of the queen of all the fairies.

In the advance of surgery veterinary science may claim perhaps a humble share. *Experimentum fiat in corpore vili*, and at least we may say we have liberally offered the vile bodies of our patients for the preliminary exercise of the surgeon's knife, but we are bound, I think, to admit that veterinary surgery can never possibly attain the position which it now occupies in its application to the human being. There are certain considerations which affect us from which the operator in human practice is entirely free. If the surgeon can leave his patient with one leg or one arm, or without arms and legs at all, if he preserves his life; if he can give the blind man enough visual power to enable him to distinguish dimly the well-remembered visage of a friend; if he can make the deaf man hear the human voice, if only at its

highest pitch, he earns the gratitude of his patients, but the veterinary practitioner must go far beyond this. If he operates with a view to improving the condition of his patient the owner demands absolute restoration. To hand him back a horse with a damaged eye or a defective limb is merely to reduce the whole matter in his point of view to a joke, and no matter how skilfully the veterinarian may perform an operation, you may depend upon it he will get no credit for success, but rather blame for failure, unless he can restore the animal to absolute soundness. On these grounds I apprehend there is little or no possibility that we shall ever stand on a level with the medical profession in regard to surgical operations, but it may be an open question if we have not carried our hesitation a little too far, and recent experiments which have taken place in regard to the surgical treatment of roaring lead one at any rate to hope there will be a little more boldness on the part of the veterinary operator, which, even if it does not always result in permanent success, would at least be tolerated by the stockowners of the country.

In the course of the various investigations which have been going on in reference to medicine and surgery, it has not always happened that the members of the medical and veterinary profession have been working in strict accord with each other. Why they have not is a question which it is rather difficult to answer offhand. Possibly both professions might agree to accept a share of the blame, as a preliminary step to better things in the future. At any rate, if we cannot successfully compete on surgical grounds, there are a number of diseases which are alleged to have a common feature in their communicability between man and animals, which require careful and patient investigation by medical and veterinary experts acting in strict consonance; and if ever a board or committee of that kind should be formed it should certainly be an instruction to them to endeavour to find out on how many points they could possibly agree, rather than to seek to discover on how many they were bound to differ.

Investigations in science cannot be worked out to a successful issue while there are any personal feelings in the way, or any special views to be proved to be right or wrong. The subject is one of too much importance to be lightly dealt with, and it is one which promises most valuable results if it is only pursued in a spirit of legitimate inquiry, which, strictly speaking, should exclude all personal feeling whatever. (Cheers.) There are some diseases which we all of us know to be communicable between the lower animals to man. We know perfectly well that Glanders has been so communicated. And in regard to Tuberculosis, which is a malady of increasing prevalence among the stock of the country, and probably still worse among the poultry of the country, there is experimental evidence that the consumption of tubercular substances—tubercular products—in the form of milk and other products of the animal body, is a ready method of communicating the disease to a number of warm-blooded animals.

Whether or not the human subject can be so infected is a point in reference to which there is no experimental evidence. The difficulty in reference to these diseases is that, excepting by accident, none of them can be proved to be communicable from the lower animals to man. A pathologist in the pursuit of his subject is bound by the laws of our civilisation, which require that, while any man may infect himself with any disease he may think fit to test, he must not infect his friends or neighbours. Therefore it is that the inquirer often finds himself hampered by evidence which is of a doubtful character, and it becomes all the more indispensable that such evidence should be most carefully sifted before any conclusion shall be arrived at.

I may pass now, gentlemen, for a few moments to a subject which interests you all specially, that of veterinary education in its practical and scientific

aspect. It is somewhat curious, perhaps, that although education is a matter which has occupied some of the greatest minds for very many years, that we are even now disputing about first principles. The question is still being asked, how and what to teach? So far as our profession is concerned we have no difficulty in answering the question, what to teach? although there may be some difficulty in deciding how to teach it; and possibly there may be still greater difficulty on your part to answer the question, how to learn it? (Laughter.) But there is no difficulty in telling you that you have to make yourself familiar with the subjects of anatomy, physiology, pathology, in relation to all the animals of the farm, and that you are further expected to have a certain knowledge of the collateral sciences, chemistry, botany, materia medica; and in addition to these you are bound at your entrance upon your studies to show that you have such an education as may reasonably be expected of a man who aspires to become a member of a liberal profession. In carrying out the curriculum of this Institution there are arrangements made for your instruction, both in practice and also in the theory, as it is commonly called, of the various sciences on which all correct practice should be based.

Taking first the arrangements for your practical tuition; we have a large infirmary in which a considerable number of sick horses are always to be found; and I am glad, more glad than I can well express, to be able to say that during the last term there were more cattle, sheep, and swine in the walls of this Institution than had ever before been seen there in the same period during the whole of its history. (Cheers.) This very fortunate result was gained in two ways: first by the liberality of the Royal Agricultural Society of England we were put in possession of a grant which enabled us to pay the expenses of the transit of animals, and to purchase those which could be obtained at a moderate cost. And next it depended on the very considerate action of some members of the veterinary profession who, instead of killing and burying animals which were most promising subjects for our purpose on account of the entirely hopeless condition of disease in which they were, obtained these animals for the College and placed them at our disposal. If I might venture to express my gratitude to the members of the profession who have so far aided us, I would beg by way of explanation to say that I use the word gratitude in accordance with its modern and literal acceptation—I mean to express a lively anticipation of future favours in the same direction. (Laughter and cheers.) Speaking generally, it may be said that the students at this College have certainly as good opportunities of acquiring a practical knowledge of their profession as they could possibly hope to possess at any similar institution during the same period of time. As to the scientific department, you will not expect to hear much. There has not, so far as I am aware, been any question as to the facilities which we possess for imparting theoretical instruction. Of my colleagues I shall not speak, except in general terms, because, as each name has a reputation belonging to it, and as each member of the staff has proved his competency to teach by long experience, it would be unsatisfactory to them to be dragged before the bar and coated with paint, even of the most glowing colours. (Hear, hear.) But it is quite permissible to say that they are all very anxious to impart information, and it may be added that during part of the vacation the system of lecturing has been, as far as possible, remodelled, with a view to prevent any repetition of subjects, and so to economise your time as far as possible. Division of each class into two classes for practical work has also been made, and each subdivision will be found to be a fixed quantity. The men whose names are down will be expected to attend, and the senior students will have opportunities of benefiting by taking part in the "cheap practice," as it is called, which brings a large number of diseased animals into the College. Then, gentlemen, there are convenient laboratories. There is the dissecting-room, which

will be frequented by the enthusiastic anatomist from morning till night, the difficulty being to drag him away for the necessary attendance on lectures. There is the chemical laboratory, which will equally require your attention; and since we last met we have constructed, on the model of the one at King's College, a bacteriological laboratory—(cheers)—which will be valuable for those who propose to conduct experiments and inquiries in this abstruse branch of their profession, and there is no question at all of the fact that it has now become a branch of our profession, and that we cannot afford to neglect its cultivation. So much, then, for the ordinary arrangements. In addition, I may tell you I have been fortunate enough to secure the assistance of some distinguished members of the medical profession, who will give a number of special lectures during the session. (Cheers.) And when I mention the names, not with a view to placing one before the other, but simply putting them separately because my powers of speech do not allow me to say them all at once—when I mention the names of Professor Victor Horsley, Dr. Klein, Mr. Watson Cheyne, whose researches on Tuberculosis and suppuration will be most interesting to you; Professor Crookshank—(cheers)—of the Bacteriological Laboratory, King's College; and Dr. Fleming —(cheers)—I think I have said enough to prove to you that there are sufficient opportunities for acquiring knowledge during your pupilage if you will only take advantage of them. But, gentlemen, there is the rub. (Laughter.) Will you take advantage of them? Speaking from a long experience as a teacher, there is present to my mind a type of student which I should be sorry to hold up to your view as representing the majority, but such as he is you shall see him. His Biblical reading stopped short at the Proverbs of Solomon. (Laughter.) He got so far as that verse, "Much study is a weariness of the flesh"—(laughter)—"and of reading many books there is no end." (Laughter.) He at once embodied the injunction, and made it part of his life. For him there is not much study, and there is no weariness of the flesh on that account. (Laughter.) For him there is no end to the reading of many books, because there is no beginning. (Laughter.)

Whatever words of encouragement, or of hopeful anticipation, have been uttered on behalf of the student, please do not apply them to the particular class of individual just depicted. Encouragement is offered only to the working men, the only class of student which we recognise here. Idleness is a disease which is perfectly well recognised in common life. Its symptoms are well defined, but it has not at all engaged the attention of the micro-pathologists; and at this moment we do not know whether it depends upon the influence of a micro-organism, or upon chemical changes produced by an unclassified alkaloid. (Laughter and cheers.) We do know, however, that nobody has yet cultivated the virus, or submitted it to a sufficient amount of attenuation to permit its use for the purpose of protective inoculation. (Laughter.) Various forms of treatment, heroic and palliative, have been adopted, but no cure has yet been found. It is one of those affections which cannot be cured, and therefore must be endured! No, we have come to the conclusion that there is between cure and endurance an alternative plan of treatment, which is known all over the civilised world as "the stamping-out system;" and we here are prepared to apply the remedy of social slaughter to all who may be found affected with the malady, and to adopt a policy of sequestration for all those who have been exposed to the infection, until we find they are sufficiently well to be turned loose again among their fellow men. It is, gentlemen, a question for you to decide which of these classes will enlist your sympathy, not, I am sure, the idle case. Without going through the form of asking you to hold up your hands, I see in my mind every hand held up to the contrary. I look upon you as a lot of working men, and as such I can promise you, some of you who have ambition and

talent, the attainment of the highest ranks of the profession. Recollect there is such a thing as increasing a demand by adding to the supply, and there is no doubt that the stockowners of this country are quite ready to welcome a small army of accomplished veterinarians, who will advise them on intricate questions relating to the outbreaks of many preventable diseases, which are not yet sufficiently worked out, but which cause enormous losses to the owners of that valuable property, the live stock of this country. Those of you who have not the ambition or desire to take the higher rank, and who may be satisfied with performing a useful part in your day and generation, each one of you may, if he chooses, have it said of him at the last that he did his work well, and contributed his full share to the prosperity of the commonwealth of which he forms a part. (Cheers.)

Dr. FLEMING: I rise with the greatest pleasure to ask your permission to propose a vote of thanks to Principal Brown for the very eloquent, instructive, and amusing address with which he has favoured us. I am sure that you all who have the privilege of being here to-day must have listened with the deepest interest to his remarks. It is the first time that Professor Brown has delivered an address to you as Principal of this College, and I am quite sure that you all, no less than the Governors of the College, no less, indeed, than the entire profession throughout the three kingdoms, feel that the direction of the College is in the best hands. (Cheers.) Gentlemen, the points which Professor Brown has touched upon in his remarkable address are points which I trust you will remember. They are of great public interest, but should more especially concern us as members of the veterinary profession. One of the points with which he was induced to commence his address was the relationship between human and animal medicine, and this is a most important matter—important not only to ourselves, who have to investigate the diseases of animals, comparing them with those of our own species, and who have to rely too much on the assistance we receive from the sister branch of medicine—I say this matter is of deep importance to us, but it is also of the highest importance to mankind; and I may tell you this, gentlemen, that in the course of about four years this Institution will have completed its hundredth year of existence, and there can be no doubt about it that one of the chief objects held in view at the institution of the Royal Veterinary College was to co-operate with the practitioner of human medicine in the investigation of disease. When I tell you that the greatest anatomist of the age—perhaps of any age—John Hunter, took the heartiest interest in the founding of this College, and took the liveliest interest in its welfare; and also that some of the greatest surgeons of the day took the warmest interest in its progress—Drs. Babington and Cline, Sir Astley Cooper and Sir Charles Bell, the great discoverer of some of the functions of the nervous system—you will not doubt that when these gentlemen lent their assistance in the foundation of the College they were thinking of the great aid which veterinary medicine should render to human medicine. Soon after these gentlemen left this world, I am sorry to say the medical profession ceased to take a very active interest in the progress of veterinary medicine in this country, and the long interregnum which has occurred since that time has not been conducive to the interests of veterinary medicine or human medicine. But I am glad to observe that of late years the medical profession—the sister profession, as it is called—has begun to take an interest in veterinary medicine, seeing that the welfare of the human species largely depends on a close acquaintance with the diseases of animals. In fact, the medical profession find in our profession a branch of medicine which cannot be separated from human medicine. The two medicines are one. The animals may be different, but the morbid processes and the course of disease are closely allied, so that the keen

physician or the good surgeon of mankind finds in the veterinary profession a profession closely akin to his own; and upon the discoveries which are made in human medicine must depend very largely the progress we make in animal medicine and the converse: discoveries which are made in animal diseases will more or less react upon human medicine. Well, gentlemen, Professor Brown also alluded to the limited scope of the veterinary profession with regard to surgery. That is true. We are limited, I am sorry to say very limited, in our aims with regard to surgery. Nevertheless, I think we have advantages the human surgeon does not possess. As you know, the human surgeon confines himself chiefly to operations on the human body, and the physician to the cure or modifying of disease. The veterinary surgeon has a much wider aim in his profession. Not only does he minister to the lame, injured, or sick animals, but to a large extent he has to do with their improvement in physical qualities, and I am only sorry to say, for the sake of humanity, that the physician has not the same opportunity of exercising his powers. Of late years, it has become a recognised fact that in animals certain maladies have a tendency to reproduce themselves in the progeny, that there is a predisposition to disease, and here it is the province of the veterinary surgeon to investigate and advise. I think if this office were allotted to the human physician, with regard to mankind, it would be highly advantageous to our common species. If the human physician were consulted in regard to the improvement of the human species, and with reference to the eradication of hereditary disease, I believe hospitals would be less required to-day, and we should have a stronger race. I do not think I need intrude further on your time, but I would say this: I would reinforce every word the Principal has said with regard to the importance of the advantages you possess in your course of instruction, and with respect to the great importance of applying yourselves heart and soul to the study of your profession. You now enjoy far greater advantages than the veterinary surgeons of fifty years ago, even of twenty-five years ago. You stand upon the shoulders of your predecessors with regard to these advantages, and I say if you do not avail yourselves of them, and make yourselves good men, the fault will be entirely your own. You may have good teachers, you may have good laboratories, possess every advantage, and yet unless you apply yourselves to study, these things will avail you nothing. It is entirely in your own hands whether you shall become useful professional men, or be social outcasts or "wastrels," as they say in Lancashire—it all depends on yourselves. You may expect, with the advantages you possess at this Institution, with the hearty co-operation you will receive from the teachers in pursuing your studies, and with the application which you should devote to your studies, that you will turn out men in every way capable of taking your place in society as useful members. There are two points of view from which you may look on the profession; there is the scientific point and the practical point. Do not separate the two. Do not believe for a moment that the scientific man is not a practical man. I say the more science you have the better, and the more you apply science the better practical man you will be. I will not intrude further on your time, but ask you to join with me in a hearty vote of thanks to the Principal for the excellent address with which he has favoured us. (Cheers.) I take it that the proposal has been carried by acclamation.

Professor Brown: It will not be necessary for me to say more than that I accept the vote of thanks with the very greatest pleasure. It is very satisfactory to me to see the theatre so well filled. I indulge in the strong hope that every one sitting before me in the position of a student will go away carrying with him all the honours which his industry can possibly obtain. I

should like it to go forth, in reference to what was said concerning the association of veterinary and medical practice, that so long as I have the honour of directing this establishment, medical men from all countries will be welcomed here. By our laboratories and general facilities we may now be in a position to offer them assistance which may at times be useful. I would wish it to be known that whenever assistance is wanted from us, every member of the staff will be most anxious to afford it.

Professor AXE read out the list of medals, class prizes, etc., which had just been awarded.

List of Medals, Class Prizes, etc., awarded at the Opening of the Winter Session, 1888-89.

COLEMAN PRIZES.

Silver Medal	Mr. W. Perryman.
Bronze Medal	Mr. W. H. Brooke.
Certificate of Merit	Mr. R. W. Knowles.

CATTLE PATHOLOGY PRIZES.

Silver Medal	Mr. W. Perryman.
Certificate of Merit	Mr. W. H. Bush.

SCHOLARSHIP.

£25 per Annum for Two Years ..	Mr. F. M. Hill.

CLASS PRIZES.

CLASS C.

Hippopathology	Mr. R. W. Knowles.
Cattle Pathology	Mr. A. James.
Morbid Anatomy	Mr. W. Shipley.
Helminthology	Mr. W. H. Bush.
Therapeutics	Mr. W. H. Bush.

CLASS B.

Anatomy	Mr. A. Bramall.
Histology	Mr. F. B. Vanderplank.
Physiology	

CLASS A.

Chemistry and Toxicology	Mr. F. E. Place.
Practical Chemistry	Mr. T. C. Garry.
Botany	Mr. J. Row.

Professor PENBERTHY said: A very pleasant task has been allotted to me, pleasant because brevity will meet the case, and pleasant because of the assurance that it will be received by you in the most hearty manner. I have to propose a vote of thanks to our President, Dr. Fleming, for having taken the chair here to-day. I am quite sure the general knowledge which the profession has of him will render any remarks on his position unnecessary, and I beg now to submit the proposition to you. (Cheers.)

Dr. FLEMING: I thank you very heartily indeed for the vote which has just been accorded by acclamation. I assure you it is always a very great pleasure to me to come here, and to-day it is a crowning pleasure. I must confess I was in hope that one of the noblemen who take such a lively

interest in this Institution would have taken the chair. In fact, I think it is well that one of the distinguished gentlemen who assist the progress of the profession in this country should undertake the pleasant office. Nevertheless, as the honour was allotted to me, I have felt the greatest pleasure indeed in acceding to the request that I should preside. I trust for many years to come I shall be allowed to be present. I am sure with advancing years the profession takes higher and higher ground, and the students here to-day will doubtless be excellent practitioners to-morrow. I look forward to those who have just graduated as the men on whose shoulders will fall the very heavy task indeed of practising the profession in the future. I thank you.

The proceedings then terminated.

GLASGOW VETERINARY COLLEGE.

THE winter session of this college was opened on the 2nd October by an introductory lecture delivered by Professor Cooke, in presence of a large number of students and others interested.

Among those present were—Dr. Morrison, Free Church College (in the chair); Professor McKendrick, Glasgow University; Professor McFadyean, Veterinary College, Edinburgh; Mr. Brand, Baillieston; Mr. Cuthbert, Glasgow; Principal McCall, Professors Limont and Tweedley.

The following members of the profession were also present: Mr. J. B. Martin, Rochester; Mr. T. Briggs, Bury, Lancashire; Mr. Carruthers, Perth; Mr. Hunter, Dundee; Mr. Reid, New Cumnock; Mr. Campbell, Kirkcudbright; Mr. Farquhar, Riccarton; Mr. Kerr, Dalry; Mr. Taylor, Cathkin; Mr. Begg, East Killride; Mr. Constable, Inchture; Mr. Scoular, Ballock; Messrs. Reddie, Blue, and Weir, Glasgow; and Mr. McGeoch, Paisley, etc., etc.

Professor COOKE said:

I find myself, on the first day of the new session, placed in the position of introducing you to your professional work.

In former years students have been called upon to listen to important matters pertaining to their profession from veterinary and medical experts. From a chemist you must not expect an address dealing with strictly professional subjects.

I shall, therefore, confine myself principally to a consideration of those subjects of your studies here in which I shall have the honour of being your guide, and for a short time I shall ask your attention to subjects bearing somewhat on professional matters, but subjects on which I think even a layman may venture an opinion.

To begin, I may remind you that this college has just completed its twenty-fifth year, so that we can consider ourselves as celebrating its semi-jubilee. Twenty-five years is not a great time in the life of an institution like this. You cannot by any means consider it venerable at that age, but you may reasonably expect to find it vigorous. In that twenty-five years, however, many and important changes have taken place in the education and progress of the veterinarian.

I have, myself, been connected with this college, and consequently in some degree with veterinary education, for about a dozen years, and during that time the students here have more than doubled, and the time of your studies has been considerably lengthened.

More is expected of you now, and in this direction your work must be more thorough and detailed. No new subject of study has been added since I first joined the teaching staff, but in many subjects the knowledge that would have enabled you to gain your diploma a dozen years ago would not now be considered sufficient for that purpose. Although, therefore, your time has

been extended, you will probably find that the burden is about as much as an average student can well bear.

I am sometimes asked by former students who occasionally pay us a visit, and whom we are always glad to see, if I think veterinary students as a class have improved since I first made their acquaintanceship. The question is, perhaps, a natural one enough, but not quite easy to answer.

I am inclined at first to say "Yes," but I find that that is hardly what the questioner expected, and it does not make him quite happy; in fact, he may even consider it a reflection on himself. I have, therefore, reconsidered the matter, and have come to the conclusion that during my tenure of office there have assuredly been some changes in the class of our students, but whether these are all improvements or no it would perhaps be invidious to say.

There is no doubt, however, that there is a considerable difference between our students now and twelve years ago. Then the average age of students was considerably more than at the present; while we had some rather young students, perhaps the majority were considerably over twenty, and a few verging on middle life. As a consequence, many of them had had some previous occupation, often some kind of manual labour; they had not been used to study, and in some cases their education was not all that we could have wished. In spite of these disadvantages, we often found men of great energy, earnest students, and endowed with good judgment and commonsense; in fact, they often turned out excellent students, and have, I believe, in many cases since developed into successful practitioners, and it will take all your ability, combined with close application, to equal, let alone surpass them. With these we had a class of students who are fast disappearing from our benches, men of middle life, who had been prevented by one thing or another from commencing their studies earlier.

Then, though honest and earnest in their work, they did not, I am afraid, always derive the benefit one could have wished. That they got *some* good is more than probable; whether they were wise in giving up their previous employment for veterinary science is somewhat doubtful.

Some may find it worth their while, but on the whole I should not like to advise a man much over thirty to begin to study for a veterinary surgeon, unless he had a great talent in that direction. Some such men may do well, and I can well remember the joy and gratitude of a promising young fellow of fifty, who remarked, on passing an examination, what a capital start in life he had got.

Another class of students has almost entirely disappeared, I mean the smith. I would say plainly, however, that I have no objection to smiths as such, and mean no disparagement to them; we, indeed, often meet with young men who have been working at the forge having a laudable ambition to become veterinary surgeons; of these I have nothing to say but in the way of praise; they are usually industrious, intelligent, and well aware of the value of time and money, and have often been found among our best students. Another class of smiths, of whom I have never seen many examples, study merely to pass and get the name of veterinary surgeon, with the idea that it will form a useful adjunct to their original business. Sometimes I have heard it said that they give veterinary advice gratis, in order to develop their smith's business. When I meet with one of these men, I always think it is a thousand pities to spoil a good blacksmith to make him into a third-class veterinary surgeon.

Within the past few years our students have been considerably younger than formerly, and the average age is not perhaps more than seventeen years. This has its advantages, as coming directly from school, they are fairly well educated, and have been used to study.

I should like, in the next place, to make a few remarks concerning the subjects I teach in this college. One of the most important subjects of your first year's study is chemistry, and this subject, so necessary to your future progress, has been regarded as one of the fundamental subjects of medical study, ranking in this respect with anatomy and physiology, and having consequently a double claim to your attention, as being in a great measure the foundation of the latter science.

From the earliest time chemistry has been closely associated with medicine; in fact, we may say that chemistry, to a great extent, arose from the necessities of the medical man; chemistry, as far as it went, was the humble servant of medicine; and that early connection has more or less been maintained till comparatively modern times. If you, for instance, write down the names of the best-known chemists of, say, the beginning of the century, you will find that the majority, perhaps, have been connected with medicine or pharmacy. The connection is now more or less broken, to the advantage of both sciences, the enormous development of chemistry that has taken place during the present century rendering it imperative that to ensure even a moderate amount of success in this subject, one's undivided attention should be devoted to it alone.

As showing the enormous progress made, we may compare the position of a student now with that of his fellow in the early part of the century. A reminiscence of Dalton, the celebrated Manchester chemist, was published by a medical man a few years ago, in which he incidentally remarks that Dalton's course of chemistry consisted of six lectures. That will surely make your mouth water. Alas, those times have gone for ever! now we have at least one hundred, besides laboratory work.

Modern chemistry—chemistry having claims to rank as a science—only had its origin in the latter half of the last century. The nature of combustion was not understood till then, and the importance of the balance was not recognised in chemical investigations. Consequently, notions of the composition of properties of bodies were often only of the vaguest kind. The result of this is seen in older works on materia medica and similar publications, where absurd remedies were prescribed, and impossible properties ascribed to them.

During the past fifty years especially the progress in all departments has been amazing, but I would particularise more especially that department known as organic chemistry. This, though always regarded by medical men as of great importance, did not at first yield any very promising result. The reasons for this were, in the first place, the right mode of their investigations had not been discovered; and in the next place, organic compounds were regarded with a certain amount of mystery, and were thought to stand apart from mineral chemistry in this respect, that their combination was brought about by vital agency. But science has become more material, and now this barrier between the two branches has been broken down. It is interesting in this connection to note that this took place with an important animal substance, urea, which was first built up from its elements without any vital agency in 1828, and this so modified our ideas as to be often regarded as the starting-point of modern organic chemistry. Since that time hundreds and thousands of substances have been obtained by the same manner of synthesis, and in the future what help the chemist can afford the medical man will especially be in this same branch of organic chemistry.

The chemist has, however, done a good deal for the student of medicine. Medical men (and when I use this term you must understand that it includes those who practice veterinary medicine) are prone to demand impossible things of the chemist, and then make uncomplimentary remarks if they don't

receive satisfactory answers. But I would first ask how you have used the materials placed at your disposal by the chemist. You have now your remedial agents prepared in a pure state, and should consequently be surer of their action; and besides that, you have at your disposal an enormous number of substances, and, I fear, you have not kept pace with the chemist, the physiological and therapeutical action of the majority of them being very imperfectly studied. Yet their investigation in many cases would doubtless repay the necessary expenditure of time and trouble, and might even react beneficially on chemistry itself, it having been found that in some cases compounds resembling each other so closely in properties as hardly to be distinguished by chemical methods, can readily be distinguished by their action on the animal body. Investigations of this kind seem particularly fitted for educated and zealous veterinary surgeons, and I hope yet to find them in this country taking a fair share of work of this nature. The object of almost all our veterinary students in their chemistry class is to qualify for the examination of the Royal College of Veterinary Surgeons, and their study of chemistry is followed as a means to attain this end. That being so, and the time of students being limited, it is of great consequence that their course of study should be wisely planned and the examinations judiciously conducted. In both these respects I think you are fairly well off, though in one or two particulars not incapable of improvement.

The R.C.V.S., contrary to the practice of some examining bodies, issue no official syllabus, and do not even always prescribe the mode in which the examination shall be conducted. This has its advantages, but it leaves a great deal to the examiners, and infers that the examiner is a wise man. I believe, on the whole, the examiners are at present a very good board, wishing to do justice to all parties—to the profession, the public, and the students. You must remember, however, that examiners are appointed for five years, and if an undesirable man happens to be appointed it is not so easy to get rid of him until he has had ample time to do a deal of mischief.

There has been a good deal of tinkering at examination matters since I have been connected with teaching here, but on the whole the direction has been one of improvement, though some matters are by no means perfect yet.

When I first came here the examination was conducted partly by veterinarians and partly by medical gentlemen. This seemed to answer fairly well, and few complaints were heard; after a few years, however, it seemed good to those in authority that veterinarians should be the sole judges of those who were admitted to their ranks, and consequently, with one or two exceptions only, the examining board was made up of veterinary surgeons. This arrangement did not quite fulfil all that was expected of it. The complaint has been made in the medical profession that examiners were not always experts, that they were behind the age in their more scientific subjects. I believe this holds good to a greater extent among veterinarians, this being a smaller profession; hence it was found that in the more scientific parts of the examination the older arrangement was to be preferred, and that has been to a great extent restored. I think it important that in these subjects at least one expert should be appointed at each table. As far as the chemistry is concerned, the examiners have always been all that could be desired, and if students failed who should have passed it was the fault rather of the system.

The mode by which your knowledge is tested admits, in my opinion, of certain improvements.

As you are aware, the examination of veterinary students is entirely oral. This is often an excellent way of sifting students, but I believe it not seldom leads to injustice. In most similar examinations there is a written paper, followed when necessary by an oral test, and this to my mind

(for I speak for myself only) is far preferable, as it gives both students and examiners a better chance. Students not seldom fail, not from want of knowledge, but from nervousness or a natural retiring disposition, while the cool, self-satisfied, and perhaps idle student gets through by making the best of his little knowledge. It is true that self-possession and coolness are not undesirable qualities in a veterinarian, but these would in many cases be a mere matter of time. For my own part, I should like to see such a written examination introduced, and I believe some of the present examining board favour the same idea. In the earlier periods of veterinary education there might have been objections to this mode of examination, but these can no longer exist.

Teachers must have a better chance of judging of the capabilities of students than examiners can possibly get in fifteen minutes, but still in awarding their positions at the end of the session we usually do so by means of written papers.

There is another way still in which I think the chemistry examination might be improved.

I believe in all the veterinary colleges a practical course of chemistry forms a part of the usual curriculum. Practical knowledge, when properly gained, is of the greatest importance, and in modern science is most rigidly insisted on; so that we have laboratories, not only for chemistry, but for physics, botany, physiology, pathology, and most other sciences. The veterinarian, too, is a great believer in practical knowledge, but strange to say, there has never been any attempt to test practically a student's knowledge in practical chemistry.

This, I think, is hardly fair to the student; he is fairly entitled to credit for any knowledge he possesses bearing on his profession, but the want of such an examination as this is a direct inducement to cram, and all teachers know that a stimulus in this direction is needed. I have spoken to all the examiners in chemistry of the last three Boards, with one exception, and they were all favourably inclined to such a step. I am told, too, that the majority of teachers desire it, and I believe the students as well. All that stands in the way of its accomplishment is a want of time. The examiners have the power to test a student's knowledge in any way they please, but each student is only under examination fifteen minutes, so this renders this kind of test impossible. If, however, he was allowed one or two hours more for the whole college, this would be all that would be required, as they might be examined all at the same time. You must understand that I do not propose to lay on any additional burden; on the contrary, I am only advocating giving you credit for knowledge for which at present you do not get full justice.

Just a few words also on another branch of your study. I mean botany. This was the latest subject added to your curriculum, somewhere about a dozen years ago, a year before I became associated with the college. One old friend, Dr. Knox, was the teacher during the first year, but he resigned it at the end of the session. I was then asked to take up that subject, and have been teaching it since. At first it had not the relative importance it now possesses, in at least an examination point of view, being associated with materia medica, and these two ranking together as one subject. When, however, a change was made in your studies it was separated from materia medica, and, with it, placed on a par with chemistry. A further change has taken place, and now your subjects for the first examination are botany, chemistry, and anatomy, and they are all of equal value as far as passing your examination is concerned.

While admitting the importance of botany to the veterinary surgeon, I should hardly rank it equal in importance to these subjects, but there matters stand at present, and we must make the best of it. During the past year,

however, a change has occurred that renders my own task, and yours also, a more difficult one. As you are aware, we formerly had a winter and a summer session, and the botany teaching was mainly, and sometimes entirely, confined to the summer session; now our teaching terminates early in May, and in Glasgow the winter is only just over at that time. That, as I said, increases our difficulties, for botanical teaching to be efficient must be practical, and this necessitates a good supply of plants, best in a fresh state. Misfortunes are never said to come alone, and during the past year the Botanic Gardens, to which we had formerly access, have been closed; and although I hope that this will be merely temporary, you must bear in mind that you will not under our new conditions get the same benefit as formerly, for the reason I have already mentioned—having a winter session only.

I have not mentioned these matters to discourage you; on the contrary, I see nothing to be discouraged about; the conditions have simply altered, and we must endeavour to accommodate ourselves to them. It will certainly, however, require greater effort and application on your part than was formerly the case. We shall to some extent have to use dried instead of fresh specimens, and you will have to make the very best use of the comparatively few fresh specimens to be obtained up to the time of your examination.

Last year in all the veterinary colleges this subject occupied an unenviable position in the examination-list: as far as my own students were concerned, they were equal to, or even above, the average of former years.

The poor results were due to a different system of marking, and the examinations not recognising the altered conditions of botanical teaching in veterinary colleges. And as regards the examination in this subject, I think that to put it on a satisfactory footing, at least one examiner should be a botanical expert; at least he should have some claim to be termed a botanist. He should also be sufficiently well acquainted with botanical teaching to be able to judge fairly what a student ought to know after a session's study; and he should be a man without fads. If such a one can be found among veterinary surgeons, by all means appoint him to the vacant post; but if a veterinary surgeon possessing the needful qualifications cannot be found, then it will only be a matter of the barest justice to the student to seek him elsewhere.

It is not out of place to remind you, however, that in another respect your difficulties are increased. A new system of marking was instituted last examination, and one of the lower marks abolished, so a student requires to be a pretty even all-round man to pass a successful examination. You must remember, therefore, that it will no longer do to pay particular attention to any favourite study; in fact, it would be wise to give most time to those you like least. There will be time enough for specialities after you have obtained your diploma.

Scarlatina and Milk Supply.

In recent years we have heard a great deal about the propagation of disease by means of our milk supply. As earnest seekers after truth, you must not always believe unauthoritative newspaper reports, as these may often be sensational, and have only a slender foundation of fact; and when once an idea of this sort has been started there is a great tendency to panic, and to blame milk for every ailment.

Yet, discounting all this, many cases of a very serious nature have occurred, which have undoubtedly been traced to infection carried by the milk supply; and it has been proved again and again that a very great danger to the health of the community exists in the distribution of this article, without proper attention being paid to sanitary precaution and supervision.

It was, I think, in 1873 that attention was first seriously called to this subject. A physician living in the West End of London had cases of Typhoid Fever in his own family, and it soon came to his knowledge that similar cases had occurred in the families of his brother practitioners and that of his neighbours.

The only common circumstance in these cases was the supply of milk, which was obtained from the same dairy. The fact of there being such a general outbreak, and of the existence of any such disease at the farm from which the milk was derived, was shortly after denied. As soon, however, as the idea had been made public there was a tendency to ascribe every obscure outbreak of any disease of this kind to the milk supply; but as such outbreaks became better and more thoroughly investigated, it has been undoubtedly proved that in many cases disease has been propagated by means of the milk supply, the disease being present in the family of the farmer or vendor, and being almost entirely confined to customers supplied from diseased sources. Diphtheria and Scarlet Fever have also been propagated in this way.

The contagion appeared in most of these cases to be directly communicated by people recently suffering from these complaints to the milk, or in other cases from having been in contact with such persons. Cases are, I believe, also known where disease has been spread by contaminated water having been used for dairy purposes.

From time to time, however, cases occurred that appeared not capable of explanation in this way. Scarlatina, for example, seemed at times to have been spread by the milk supply, although this disease had been unknown in the families of the farmer and vendor, and sometimes even in the neighbourhood for months before, and that, too, in places where the general sanitary conditions were unobjectionable, the water supply good, and intelligent attention paid to known precautions against the spread of infection.

Cases of this kind had occasionally occurred, but no very thorough investigation took place in any of them till a few years ago. Some of you will doubtless remember that at our last year's meeting allusion was made to what is known as the Hendon case; and as this was the first case thoroughly investigated, with your permission I will briefly recapitulate the particulars of that case, as they may not be known to you all. I do so more especially as we have lately had a similar case nearer home, to which I shall return immediately.

In December, 1885, the medical officer of health in one of the districts of the West End of London reported an outbreak of Scarlet Fever, and after due investigation, it was conclusively shown that the spread of the disease was coincident with the milk supply from a dairy farm at Hendon. But now the difficulties began, because on further inquiry it was found there had been no case of disease in the family of the farmer, or in that of any of the people employed on the farm or their families, and in fact the neighbourhood had been singularly free from this disease for months previously. Although, therefore, the evidence pointed to the spread of the fever from this farm, yet it was pretty plain that it could not have occurred by any hitherto known methods of infection.

On further investigation attention was directed to some cows purchased some months before; these, though apparently healthy and feeding well, were thin, and not equal in appearance to the rest of the stock. When attention had been drawn to these animals it was also found that the hair came off on certain parts in patches, and there were small scabs or ulcers on the teats and udder. Other portions of the stock were somewhat similarly affected; these were placed in a shed by themselves, and their milk ordered to be destroyed. The men employed on the dairy farm not believing there was anything wrong with the cows or the milk, gave some of the latter away to

some families that had asked for it, and in these families Scarlet Fever shortly afterwards appeared. (This was the first appearance of Scarlet Fever in the neighbourhood of the farm.)

The cows in which the above appearances were first noticed were removed to the Brown Institution, in London and were afterwards killed, and their kidneys and other organs were found diseased.

In the scabs on the udders micrococci were found, and calves inoculated with the matter from the scabs exhibited somewhat similar *post-mortem* appearances, and in the tissues of these inoculated calves the same organism could be found as existed in the ulcers on the cows. The milk from the cows was ropy in appearance on standing.

I now come to a somewhat similar case nearer home. Some of you will no doubt remember that in the spring of this year there was an outbreak of Scarlatina and sore throat in this immediate neighbourhood, being in fact mostly confined to Garnethill. On investigation it was found that in this district 101 cases of these two complaints had occurred, and further that, with one exception, the milk supply came from the same dairy. Further inquiry showed that in the family of the dairyman no case of Scarlet Fever had at that time occurred, nor in the family of the farmer, nor in the families of the farmer's employés. (The disease afterwards appeared in the families of both farmer and dairyman, but that was a fortnight after its first appearance in Garnethill.) It will be seen, therefore, that this was a case very similar to that at Hendon, and further examination showed more resemblances still.

A visit was paid to the farm by Dr. Russell and our own principal, and they found that the general and sanitary arrangements were satisfactory, but two of the cows exhibited the same appearance as has been described in the case of the Hendon cows. On account of their feeding well, the farmer did not suspect anything wrong with them. They were removed to the College, where they remained for some weeks. In appearance they were somewhat thin (towards the end of their stay they improved in this respect), and they presented the same appearance as the Hendon animals as regards hair and the occurrence of ulcers or scabs on the teats. The temperature was taken twice a day, and was fairly constant and normal. In the case of their urine, however, there was a considerable disturbance from what one usually finds. The specific gravity was high, there was a considerable quantity of albumen present, and an enormous amount of uric acid, reaching in one instance to more than 1·7. This acid, as is well known, does not occur in the urine of the healthy animal, but may often be found when there are disorders of the kidneys or lungs.

In the case of the cows investigated at the Brown Institution there was a diseased condition of the kidneys, and also in a calf killed here; and perhaps it is not unfair to assume that the presence of the uric acid and albumen indicated the probable presence of a similar condition in the cows here; but as these were not killed, this must not be taken as proved.

The milk was also examined, and a condition similar to that of the Hendon cows was noted.

There was a decided ropy appearance, and a partial separation of curd on standing. The specific gravity was very low, about 1,025, and the total solid matter only a little over 8 per cent., against 12·5 in normal milk, and there was a great deficiency of butter fat.

Dr. Limont has furnished me with a few particulars of the investigations made by Dr. Carmichael and himself, from which I gather that a calf fed from the milk of these cows after some time exhibited the same appearance as regards the hair coming off in patches as the cows, that micrococci were found in the milk from the cows, and that the same organisms were found in the calf when killed and in cultivations from the same animal. In the same

calf there was a diseased condition of the kidneys, somewhat similar to that found in the Hendon cows. I have no doubt but full details will afterwards be published, but in the meantime I have permission to state so much. I do not pretend to say that it is absolutely proved, or at all universally admitted, that the Scarlet Fever was actually derived from the cow in the way suggested, but I think a case has been made out for further careful investigation as opportunity occurs.

Tuberculosis.

Another matter of the greatest importance, both to the public and to the medical and veterinary professions, is that of Tuberculosis; and as this subject is occupying some attention at the present time, it may not be out of place to allude to one or two matters in connection with it. This disease is, as you are aware, very prevalent, much more so than most people outside the veterinary and medical professions are aware of. It may be also taken as absolutely proved that it is capable of being communicated from one animal to another by means of either the flesh or milk. There is also no doubt that it may also be communicated from the lower animals to man by the same means.

This being so, the extensive existence of this disease is of vital importance to the community at large.

The importance of the subject is increased when it is remembered that at present there exists no means of dealing efficiently either with the flesh or milk of such animals as may be afflicted with this disease, and that the guardians of the public health are, to a certain extent, powerless to prevent the sale of either the flesh or milk of such animals.

The disease, though not readily detected in the living animal, may be recognised in the flesh of such animals when slaughtered; but the further important question then crops up, What is to be done with the flesh of such animals, in which tuberculi have been found? Our population are not overfed, and we cannot afford to waste meat fit for human consumption; at the same time, no risks to the public should be allowed, especially as in cases of this kind the danger falls on those least able to protect themselves.

It is well known, however, that in this, as in many other kindred cases, all danger may be avoided by efficient or thorough cooking. If the degree of heat be sufficiently high to destroy the vitality of protoplasm, all danger may be avoided; this, however, is not always such an easy matter as at first sight appears. Meat may be, and is frequently, used cooked very imperfectly or not at all, in which case there would be very great danger indeed. And this would perhaps be more likely to occur in animals of this kind than in those which are quite healthy and in good condition. These animals are, I believe, known to the trade under the technical name of "mincers," and if made into sausages there is hardly a form in which it would likely to be more dangerous.

I have hitherto been calling Tuberculosis a "disease," but I believe the difficulties in dealing with it lie in this, that it is not placed in this category in the Contagious Diseases (Animals) Act. That Act mentions, among other diseases, Cattle-plague, Foot-and-mouth Disease, and Pleuro-pneumonia, and expressly provides that the flesh of animals suffering from these diseases may be destroyed if its consumption would be attended with danger; and the milk of animals so affected is not allowed to be sold for human consumption, or even given to pigs, without being first rendered harmless by boiling.

If, therefore, medical officers of health and veterinary inspectors had the same power of dealing with Tuberculosis as they have with those diseases comprehended in the Contagious Diseases Act, they would be in a position to deal more effectually with an important matter affecting public health.

It seems to me, however, that this is not all that is required. It is all very well, and only right, to kill animals from certain diseases such as this, but as a layman it appears to me that more attention should be paid to the prevention of such diseases, because I believe I am right in saying that many of them are preventable if sufficient authority were given to men competent to deal with them.

In Tuberculosis, for example, the conditions under which it arises are fairly well known. It is, I believe, known that want of ventilation and of obvious sanitary precautions are favourable to its occurrence, and this danger is rendered more real by the modern practice of confining cows to sheds for a greater portion of their lives than formerly.

To kill, kill, and kill only seems a clumsy expedient, unscientific, unsatisfactory, and unworthy of the present advanced state of medical and veterinary science.

Now, if I venture to make a suggestion I hope no one will be ill-natured enough to begin quoting poetry about fools and angels, but chemists have had some experiences that might afford food for thought in this matter.

It requires only a little knowledge of chemistry to be made aware that however fascinating the study, it is accompanied by certain conditions not appreciated by outsiders; in fact, a chemical Philistine will tell you plainly it is an unmitigated nuisance.

When operations are carried on on a manufacturing scale this of course becomes an important matter, and considerable attention has been paid to the abatement of such nuisances. This has rarely been done voluntarily on the manufacturer's part, but only under compulsion; but when compelled he often finds that the proceeding has been an economical one. Now, I would ask is such a result beyond the range of possibility or probability in the case of Tuberculosis? Why should not stock-keepers be compelled to keep their cattle under proper conditions if it is for their own advantage as well as that of the public? It seems not impossible if a beginning were made here, and when good sanitary conditions were obtained, then begin to kill the affected animals, you would be on a surer and more scientific basis, and in the end it would not only be a public benefit, but be profitable to the farmer as well.

I am afraid, however, that we are somewhat slow in moving in such things, but an intelligent interest by our rising race of farmers may do much.

It is gratifying, however, to know that something may be done in this matter in the near future. A Departmental Committee, appointed by the Privy Council, have taken evidence regarding the prevalence of Tuberculosis, and they recommend that it shall be classed with Cattle-plague, Foot-and-mouth Disease, etc., so that if these recommendations are sanctioned by Parliament the same power will be possessed in dealing with the disposal of diseased animals, and the milk of those known to be diseased, as now exists in the case of all other scheduled diseases. This, if not all that might be desired, is at least a step in the right direction, as it will enable those in authority to deal at least with the grosser forms of this disease.

You must accept these remarks for what they are worth. My only excuse in bringing them before you is that matters pertaining to the prevention of diseases will likely occupy more of the attention of the veterinary practitioner in the future than they have in the past; and they seem also worthy of your notice as opening up important questions in comparative pathology.

It is usual on occasions like the present to conclude with a few words of advice and guidance to our junior students. I have not much to say on this subject. Good advice is plentiful and cheap, and it is not so often followed as it should be; and perhaps students sometimes get too much advice and lecturing. In fact, it would be interesting to take turn about, and put up an intelligent student to criticise, advise, and lecture the teachers as to their

conduct, lectures, and general proceedings; it might do good, and let us see ourselves as others see us.

However, after all, I will make one or two general remarks before concluding. The work now required of you is such that it can only be performed properly by those having a tolerably vigorous body and mind.

Sometimes, but not often, our students work too hard, and injure their health. In my opinion, however, they oftener injure themselves by not working hard enough.

Steady rather than hard work is what is required of you. Many of our students are enthusiasts at first, and full of good intentions and resolves, but cool within a month, and in the end are nowhere.

Some, again, have no enthusiasm, but seem to have a notion that the teacher does everything, and the student is merely a passive agent.

A good deal of energy, too, is wasted by being misdirected. I have even known students attempt to learn their text-books by heart, and accomplish it; and when their formidable task was done they found themselves like David in Saul's armour, in the possession of what was a hindrance rather than a help. Above all things, read little, and attach some meaning to what you read. I well remember a student coming to me in great trouble; he was making no progress, so he said. I asked him if he read at home. Yes, he read fifty pages a night—read, in fact, as long as he could keep his eyes open; he sometimes fell asleep reading, but in the end he knew no more than at the beginning. I advised him to read two pages instead of fifty, not to read except he felt in proper trim, and to make sure he understood what he was reading about. He possibly took my advice, for he afterwards turned out a successful and intelligent student.

Accustom yourselves to look at a fact on all sides, and not merely as presented to you in the text-book, or even by the teacher. I often find that a student knows a thing well in a text-book style, but in no other way. Ask him, for instance, how he will make hydrogen, and he will be quite pat with the answer; ask him, however, what happens when you pour dilute sulphuric acid on zinc, and he will possibly say he never heard of such a thing.

I trust the session now begun will be a successful one, and the beginning of an honourable professional career to you all.

NEW VETERINARY COLLEGE, EDINBURGH.

THIS college was opened for the session 1888-9 on Wednesday, the 3rd October, at two o'clock. The chair was occupied by the Earl of Haddington, and among others upon the platform were:—Colonel Maclagan; Captain Steuart; Mrs. W. O. Williams; Mrs. Ivison Macadam; Miss Blackhurst; Messrs. Aitken and Miss Aitken; Mrs. Kirk; Mrs. Adamson; Mr. and Mrs. Rutherford; Mrs. and Miss Walker; Mrs. Douglas; Mr. Gillespie, A.V.D.; Mr. Cunningham; Mr. Borthwick; Mr. McGregor; Mr. Cuddy; Mr. Tawse; Mr. Liddel; Mr. Taylor; Mr. Spreull; Mr. Bannatyne; Mr. Phillips, A.V.D.; Mr. Hutton; Mr. Reid; Mr. Mackay, Educational Institute; Mr. Martin; Mr. W. Woods; Mr. Briggs; Mr. Robinson; Mr. Ritchie; Mr. P. Moir; Mr. Edmondstone; Mr. Gray; Mr. S. Wilson; Mr. Storrie; Mr. Brown; etc., etc.

The following apologies for non-attendance were received: Marquis of Lothian; Sir W. Turner, Edinburgh; Sir Henry Simpson; Professors Brown, C.B., and Pritchard; Major Hall, 15th Hussars; Messrs. Clarkson, Leeds; W. A. Taylor, Manchester; Wragg, London; Greenhalgh, Leeds; Purdy, Belfast; Dobbin, Waterford; Nield, Siddall; Hickes, Yorkshire; Faulkner, Manchester; Baird, Hay; Banham, Cambridge; Swan, Edinburgh; Wolstenholme, Manchester; Urmston, Bolton; Clark, Southport; Hurndall,

Blackheath; Olver, Tamworth; Hack, Leicester; Mutter, Edinburgh; Fullarton, etc.

The CHAIRMAN, who was received with prolonged applause, said, Ladies and Gentlemen,—I have been asked to occupy the chair on this important occasion—the opening of another session of this college—and recognising as I do the value and importance attached to the veterinary art in such a country as this, or indeed in any country, it affords me very great pleasure to do so. (Applause.) I may commence by saying that I am not going to give you an address, but to listen to one from one more competent to do so than I. I have had the pleasure this morning of going round the college with Professor Williams, and looking into every department, and I must say it was a very pleasurable visit. Everything I saw persuaded me that the institution is in every way most admirably fitted and adapted for its purpose. (Applause.) And, gentlemen, when I look through the list of professors and teaching staff I cannot but think that this college is as fortunate in obtaining the services of such gentlemen as the students of the college are in having the instruction so competently given by them. (Applause.) I believe it is a recognised fact that Scotchmen generally make their mark; anyhow, it is a recognised fact that Scotchmen succeed pretty well wherever they go. Not only do they succeed in most things which they take in hand—not only do they succeed in the pursuit of commerce or agriculture, but in science and in art. (Applause.) It seems to me that they more especially excel as professors of the healing art, as followers of surgical and medical science; and by this I mean, not only as regards the human subject, but also as regards the domestic animals, whose life and health are so valuable, so essential to man. Now, in regard to the first class of whom I speak—of those whose study has been the human subject—it would be invidious on my part to mention or particularise any one at the present moment as a distinguished ornament or a shining light in his profession, here or elsewhere. But when I refer to those at present practising their profession here or elsewhere I think that we as Scotchmen may be proud when we recall the names of some that have been taken from us for ever; when we recall the name of Mr. Liston, a man I remember, though perhaps few of you here do, a man whose heart was as great and kind as his hand was strong and steady; or when we recall the name of Sir James Simpson, a man who was the discoverer of the application of anæsthetics, not only to mankind, but to our four-footed friends. Chloroform, as you know, is now used in treating animals suffering from tumours, and in other necessary but painful operations. When we recall the names of such men we may be proud of them. We can look upon them as benefactors to mankind. But to refer to the second class, those who study, not human, but animal life. I say we may again congratulate ourselves upon the fact that the colleges of Edinburgh have sent forth practitioners in the veterinary art who have distinguished themselves in every part of the civilised world. (Applause.) Amongst those who passed recently away I recall such names as Robertson, Dick, and others; and in the present day I think we need not look very far (looking towards Professor Williams) to see one who has made a name, an enduring name, for himself, and has arrived at the top of the tree. Now, gentlemen, I began by saying it was not my intention to make you a veterinary address, because I am not competent to do so, and because if I did I should be infringing upon the ground of him who is to address you on the same subject. I should like, however, just to say a few words more. I can remember many great changes in the veterinary art. I remember, for instance, when before a horse was sent out to grass or turned out to the straw-yard it was thought necessary to blister him "fore and aft," as the sailors say, and when he was taken up again he went through three courses of physic. The first was called "stirring

up" the humours, the second I do not remember, and the third was for "allaying" them. Veterinary knowledge has dispelled such needless, almost barbarous practices. But, gentlemen, though I do not pretend to go any farther in this direction, I should like before sitting down just to make one or two remarks, or—if you do not think me impertinent—to give you one or two words of advice. Now the science necessarily requires a great deal of study. Not only in the abstract does it require great study, but it is a science that of necessity combines the knowledge and acquirement of various others of the great sciences; anatomy, botany, chemistry, and many others are necessary acquirements to become adepts in your science of the veterinary art. What I would say is this: The one great thing which obtains for a man success in any science or art—as in learning a language, in painting, drawing, or music—the one great thing necessary is a thorough groundwork, thoroughness in study, and thoroughness in work. I know what "cramming" is, because I have tried it myself. Cramming may pass you through an examination, may even get you a diploma, but, depend upon it, it won't pay. As the Americans say, "it is not business." (Applause.) A thorough groundwork in the elements of your profession, that is the rock on which to build your house. (Applause.) Without thoroughness in study and thoroughness in work, depend upon it you will never achieve eminence or success in your profession. (Applause.) I will give one other word of advice to young students, and it is this: When you go forth as practitioners in the world, remember that there are few things more conducive to success in your profession than giving undivided, untiring attention to your subject. By subject I mean the patient or animal under your charge. This attention is absolutely necessary. I am quite aware that it is not always in the power of a professional man to give the time necessary to see his orders thoroughly carried out, but where it is possible do it. You may give the very best directions and instructions; your prescriptions may be all right; but in many cases, through ignorance, or sometimes the prejudices of illiterate grooms or other servants who have to carry out your orders, those orders are not properly carried out, and your treatment fails. Give, if you possibly can, undivided attention to your work; show that you take up your case *con amore*. Enter into it with a determination to do your very best, and it will gain you popularity and consequent success. I have already detained you too long with these remarks. I must thank you for the patient hearing which you have given me; and I will now call upon Professor Macadam to give you the introductory address. (Loud and prolonged applause.)

Professor Ivison Macadam then delivered his address.

My Lord, Ladies, and Gentlemen,—In former introductory addresses we have had laid before us the history of veterinary teaching, both in this country and on the Continent, and we have also from time to time considered the special history of this college. With these subjects we are well acquainted, and therefore I have thought it might be better if, instead of following the historical line, I branched off at one of the junctions between the grand main trunk and my special subject of chemistry and toxicology.

Before doing so, however, permit me, my Lord, to express to you the pleasure we feel in the honour you have conferred upon the college, upon its principal and teachers, and upon its students, by your presence here to-day, and I need not assure you that the interest you have thus shown in the science and in the college will long linger in our memories and will be one of our most pleasant recollections.

Whilst thinking over various connections of chemistry with the general subjects taught in this college it has appeared to me that we might, with some profit, and, I trust, a little interest, consider a few of the forms of chemical action. Chemical affinity is said to be shown when two or more unlike

substances combine together to form a new body, which has properties unlike the substances which have gone to form it. The force exerted during such a combination is chemical action. In all chemical actions it should be possible to represent the combination symbolically, and the one half of the equation should exactly balance the other half. Nothing should be gained or lost. I represent this by a simple reaction, viz., that of oil of vitriol on chalk, and which I may write down thus :—

$$\underset{\text{Chalk.}}{CaCO_3} + \underset{\text{Oil of Vitriol.}}{H_2SO_4} = \underset{\text{Stucco.}}{CaSO_4} + \underset{\text{Water.}}{H_2O} + \underset{\text{Carbonic anhydride.}}{CO_2}$$

Some chemical actions, however, are not so readily understood, as they seem to require the presence of a body which, whilst it is not itself decomposed or altered, appears to have the power of compelling the other substances present to react on each other and undergo chemical change. Such actions were long ago styled "catalytic" actions, or actions of contact.

Under this heading fell many of the more difficult chemical problems, but most of these have now been transferred to the "known" from the darker regions of "catalism." Amongst the few remaining catalytic actions, the majority are what are known as "*fermentations.*" Fermentation may be one of two classes—it may be caused by a *soluble* ferment or by an *organised* body. In the first case the ferment does not appear to increase in quantity during the process; it has no organised structure, and its action is not affected by the addition of chloroform or by compressed air. In this class we have the change which takes place when grain undergoes the process of malting, the starch of the grain being broken up by the ferment diastase, in the presence of water, into dextrin and glucose. The equation is—

$$\text{(Diastase)}\ \underset{\text{Starch.}}{4C_6H_{10}O_5} + \underset{\text{Water.}}{3H_2O} = \underset{\text{Dextrin.}}{C_6H_{10}O_5} + \underset{\text{Glucose.}}{3C_6H_{12}O_6}$$

Cane sugar is not directly fermentisable, but in the presence of the soluble ferment, *invertin*, which invariably accompanies yeast, is converted into the fermentisable glucose :—

$$\underset{\text{Cane sugar.}}{C_{12}H_{22}O_{11}} + H_2O\ (+\text{invertin}) = \underset{\text{Glucose.}}{C_6H_{12}O_6} + \underset{\substack{\text{Levulose.}\\ \text{(Dextrose.)}}}{C_6H_{12}O_6}.$$

Possibly, however, the most interesting series of these catalytic actions is to be found in the changes brought about in the glucosides when they are brought into contact with water. We take, for instance, bitter almonds, which contain a glucoside, called amygdalin, and a soluble ferment, emulsin; bruise them and mix with water. Almost immediately we note the smell of "bitter almonds," and which is due to the prussic acid that has been liberated during the fermentation instantly set up on the addition of water. The action is written thus :—

$$\underset{\text{Amygdalin.}}{C_{20}H_{27}NO_{11}} + 2H_2O\ (+\text{emulsin}) = \underset{\text{Glucose.}}{2C_6H_{12}O_6} + \underset{\text{Prussic acid.}}{HCN.} + \underset{\text{Benzoic aldehyde.}}{C_7H_6O.}$$

A further illustration of this class is obtained from salicin (present in willow bark), and which yields by the very same process a substance called saligenin and glucose.

$$\underset{\text{Salicin.}}{C_{13}H_{18}O_7} + H_2O\ (+\text{synapstase}) = \underset{\text{Saligenin.}}{C_7H_8O_2} + \underset{\text{Glucose.}}{C_6H_{12}O_6}.$$

There are many others of the same series. Arbutin passes into hydroquinone and glucose; helicin gives, besides glucose, hydride of salicyl; phloridzin, present in apple and pear bark, splits up into glucose and phloretin; esculin, from horse-chestnut bark, into glucose; and esculetin and

daphnin, in the bark of mazereon, into glucose and daphnetin. One peculiarity of these reactions is that the actual presence of the soluble ferment is not necessary, but its place may be taken by an acid. The pancreatic fermentation and the protëic fermentation, the latter of which causes the solution of the protëin substances in the stomach, belong to this class of catalytic reactions. You will notice that they are all processes of hydration, water being a necessary condition, and in this respect agree with the next series I am to mention.

The second class of fermentations to which I desire to draw your attention differs from the previous series in so far as they *are* brought about by ferments which are *organised*, and which *increase* in bulk during the continuance of the process. Chloroform, which has no action on the soluble ferments, stays or kills the organised bodies, and compressed air is said to have the same effect. The organised ferments are extremely simple forms of life; they lie on the border-line between plants and animals; and whilst some are acknowledged to be vegetable, and others to be animal, yet a considerable number may be looked upon as rather indefinite, and are, in fact, a fighting-ground and the cause of much contention. Luckily, it is unnecessary for us to decide between plant and animal, as it is only on the chemical side we require to look. They are living organisms, and the functions they perform, the chemical actions they decide, can, as a rule, be only carried out by their aid, or if otherwise, then only by extremely round-about methods.

Some of these organisms are well known, and their actions acknowledged. Take, for instance, the yeast plant (*Saccharomyces cererisiæ*), which has the power of converting glucose into ordinary alcohol and carbonic anhydride, and which is regularly used for this purpose. In this case one part of glucose yields two parts of alcohol and two of carbonic anhydride.

$$C_6H_{12}O_6 = 2\,C_2H_6O + 2\,CO_2.$$

Other and secondary reactions also take place, and cause the production of other substances; but these we need not discuss, as they do not alter the main equation. Yeast not only causes fermentation in solutions of glucose, but also directly in solutions of levulose, maltose, and galactose (lactose), whilst indirectly it can also ferment liquids containing cane-sugar, melitose, trehalose, starch, gum, dextrin, and the animal sugar glycogen.

Yeast can also cause fermentation in solutions of other substances, such as malic acid and glycerin, but in these cases the product is not alcoholic, but acid, although carbonic anhydride is given off.

Yeast is not the only alcohol-yielding ferment. It is well known that fruit readily enters into a state of fermentation. In this case the ferment, although belonging to the same family as yeast, differs from it in form and size, and the liquid infusion produced is different in taste. The ferment here is *Saccharomyces apiculatus*.

In both the above cases the ferment requires the presence of oxygen for its growth, and these ferments cannot, therefore, account for the production of alcohol and carbonic anhydride, which takes place when the fruit has been excluded from air. The action in such instances is due to one of two ferments—*Mucor racemosus* or *Mucor mucedo*.

The vinegar which is produced when beers are allowed to come in contact with air is formed by the aid of the organism known as *Mycoderma aceti*. This body is an oxygen liver, and the process of souring can be readily hastened by causing a free access to air. In this country beer-vinegar, or malt-vinegar, is made by the barrel process, which simply consists in filling so many casks half full of beer, and allowing air to enter by the open bung-hole. In time the alcohol of the beer is converted into acetic acid or vinegar, and the vinegar can then be separated by distillation. On the Continent, how-

ever, a much more rapid process is adopted. A large cask, fitted with a false top and bottom, is filled loosely with hard-wood shavings; the false top is perforated with a series of holes, which are filled with cotton wick. The beer is poured into the upper part of the apparatus, finds its way by capillary attraction down the wicks, and trickles over the shavings in a fine stream. A current of air is meantime allowed to pass through the shavings, a large surface is exposed to the atmosphere, and so the process proceeds rapidly. The chemical formula representing the action is represented thus:—

$$C_2H_5, HO + O_2 = C_2H_3O, HO + H_2O.$$

To the same class belong the various vegetable ferments obtained by Hausen (*Bot. Zeit.*, 1886, 137) from the latex of different plants, and which have the power of peptonising albumenoids. Similar results have been obtained by Brasse (*Ann. Agronom.* xii. 200) from green leaves, showing that they also contain an active ferment.

The phenomena of putrid fermentations, or putrefaction, are very similar to those of ordinary alcoholic fermentation. An organised ferment is necessary, and the actions only proceed in the presence of water. Here, however, the substances acted upon are albumenoids, or peptones derived from them, and the products formed are more simple in composition than the materials they are produced from.

Gautier and Etard (*Comptes Rendus*, xciv. (1883) 1598-1601) consider that putrid fermentation may be explained by regarding putrefaction as a breaking up *by hydration* of the complex albumenoid molecule into the simple nuclei which go to make up the albumen.

During putrefaction there are produced aromatic bodies and bases, and if the above theory is correct the albumens are necessarily compounds of the bases with the aromatics. If this statement is proved to be true, then much of the present difficulty regarding the composition of the albumens as a class will have been removed. No series of substances present so much difficulty to the chemist as the albumens do. They are amorphous, non-crystallisable bodies of great complexity, and have up till now baffled all attempts to discover their constitution.

The fermentation or putrefaction of these albumenoids is carried out by various members of the family of organisms known as bacteria. These are unicellular organisms devoid of chlorophyll, and are often aggregated into colonies. Cohn has classified them into—first, those which are globular (sphærobacteria), and which are further subdivided into (*a*) simple cells, or micrococci; (*b*) double cells, or diplococci; (*c*) cells in colonies surrounded by a common membrane, or zoogloci; and (*d*) into curious cross-shaped cells, or sarcini. The second division of the family are rod-like, and constitute the microbacteria of which the only subdivision is bacterium. Desmo-bacteria are made up of larger rods, or are filiform (filo-bacteria), and are subdivided into straight rods, or baccili, or where curved are known as vibrios. Twisted, or spiral bacteria (spiro-bacteria), are divided into those which are made of long close spirals (spirochæta), and short, open spirals (spirrilliæ).

Chemically bacteria may be classified (*Liborius, Chem. Centra.*, 1886, 579) as—

(1) *Anærobic*, or those which do not require air for their life. The members of this division frequently *do not* lead to fermentation.

(2) *Ærobic*, or those which require air for their existence, and which are reduced to inactivity when deprived of oxygen. In this class we have *Bacillus fuscus*, *B. cyanogenus*, and *B. subtilis*. The members of this group *may* cause fermentation.

(3) *Optionally anærobic*, in which vitality is lowered by the absence of

oxygen, but not totally suspended. This is the pathogenic class, and therefore includes *B. anthracis*, *B. typhi abdom.*, etc.

The members of this latter subdivision are frequently thrown into the ærobic class, as oxygen is undoubtedly necessary for their reproduction.

The substances formed by these bacilli are frequently most energetic, and very often highly poisonous. They contain nitrogen, and are members of the class of substances known as alkaloids. Originally this class of bodies consisted simply of a few organic bases derived from plants, and which, on account of the fact that they were alkaline, and exerted basic properties like the inorganic alkalies, potash, soda, and ammonia, were called vegeto-alkalies or alkaloids. Later, certain animal substances were added to the series (urea); and afterwards, as the science of organic chemistry progressed, a large addition was made in the so-called artificial alkaloids, or compound ammonias. The substances produced by putrefaction have the distinctive term applied to them of *Ptomaines*. This name was first given by Selmi (*Zeitschr. des Œsteri Apoth. Ver.*, March 1, 1878), to a base which he had isolated from exhumed human bodies.

In May of the same year (1878, *Moniteur Scientifique*) Selmi printed a further paper, giving the results of a much more extended research, in which he showed that instead of one ptomin, there were a series of these cadaveric alkaloids obtainable from putrescent animal matter, and he gave the general properties of the class, as also some of the tests. Sulphuric acid he found to give a red-violet coloration, hydrochloric acid mixed with sulphuric acid a red-violet colour, and sulphuric acid with bromine water a red-violet colour which faded. These tests are of interest as being closely allied to a principal test for strychnine.

Being so extremely like the alkaloids in their general properties, they become very important in toxicological cases, and it is of the greatest importance that we should be possessed of some one or more tests which would without doubt show the presence or absence of the class.

Panum proved that all albumenoid substances when allowed to putrefy gave rise to poisonous compounds, and Bergman shortly afterwards described a putrefactive compound which he called "sepsin." Panum and Schweninger continuing the research, showed that the poison produced depended on the stage that decay had reached; in other words, that instead of one body, sepsin, a series of "ptomaines" were formed, and that these substances differed in their physiological actions.

Sonnenschein and Zuelzer, working with the fluid from an anatomical maceration, obtained an alkaloid which had all the characteristics of atropine, and they also obtained a like substance in poisonous sausages, and a further body which produced tetanic symptoms was noticed. Tetanic spasms are also produced by a substance formed during the putrefactive decay of ordinary maize (Lombroso and Erba), and the spasms are accompanied by after-narcotism. This last, however, may be due to the presence of lactic acid or sodium lactate, both of which produce effects very similar to those of morphia. The production of putrefaction compounds may be the cause of the tetanic symptoms traceable to wounds which have not been antiseptically dressed, and the skin diseases which occur after partaking of decomposing fish are doubtless due to "ptomaines."

Sonnenschein's alkaloid has also been obtained from the bodies of patients dying from Typhus Fever, showing a close analogy between the condition of the body during putrefaction and whilst under the fever.

Brouardel and Bouting (*Comptes Rendus*, xcii. 1056) proposed as a distinguishing test the reducing action possessed by the ptomaines on potassium ferricyanide, and which power they stated was not possessed by any of the vegetable alkaloids, excepting only morphine and veratrine. Gautier (*Repert. de Pharm.* ix. 278), however, has shown that this reaction is also

produced by hyoscyamine, emetine, igasurine, colchicine, nicotine, and apomorphine, as well as by a number of poisonous artificial bases, and Tanret (*Repert. de Pharm.* x. 281) has shown a like reaction with ergotinine, aconitine, digitalin, and eserine. No other test has as yet been discovered which will prove decidedly the presence or absence of the ptomaine class, and this knowledge has done not a little to complicate toxicological investigations.

Guareschi and Mosso (*Jour. für Pract. Chem.* xxvii. 425-432) have obtained from washed ox-blood-fibrin, after decomposition for five months, a strongly alkaline brown oil, with a faint conine-like odour, and having the composition of $C_{10}H_{15}N$. Its physiological action is similar to that of curare, but it is less active. Giacomelli (*Zeit. des Œsteri Apoth. Ver.*, March 1st, 1884) has found that during the putrefaction of albumenoids an alkaloidal body is produced which gives many of the tests for picrotoxin, although it differs from that substance in its physiological action. The presence of a similar material in a sample of beer led to the belief that the liquid had been adulterated with cocculus indicus, but after-proof showed that the poison had been derived from the alteration of the albumenoids of the grain.

Brieger (*Ber. der Deutsch Chemisch. Ges.* xvi. 1186-1191) has further shown that during the first stages of the putrefraction of albumenoids poisonous compounds are produced which have actions similar to those of curare, but that these actions disappear after from eight to ten days. He has isolated several of these basic bodies from decomposing flesh. One of them has the composition of $C_5H_{14}N_2$, and is a gelatinous mass with a characteristic and disgusting odour. It forms a series of salts which are readily crystallised in needle-shaped crystals, and which do not possess the disgusting odour of the pure alkaloid. From the residual liquor left after removal of the previous body another and most poisonous substance can be isolated. It has the composition of $C_5H_{11}N$, and a small dose of the hydrochloride caused "a rapid flow of the saliva, strong secretions from the nose, and a constant flow of a watery fluid from the intestines, with finally convulsions." A subcutaneous injection causes increased activity of the heart, rapid respiration, and the saliva becomes alkaline. Cats under its action perspire freely at the paws, and the sweat is decidedly alkaline.

Decomposing flesh has also yielded Brieger neuridine, $C_5H_{14}N_2$, and neurine, $C_5H_{13}NO$. Putrescent fish gave ethylidenediamine, $C_2H_4(NH_2)_2$, muscarine, $C_5H_{15}NO_3$, and the non-toxic gadinine, $C_6H_{17}NO_2$, etc.

It the earlier stages of decomposition in the human subject only choline is produced. After three days neuridine is formed and choline disappears, and is replaced by trimethylamine $(CH_3)_3N$; after fourteen days cadaverine, $C_5H_{16}N_2$, and putrescine, $C_4H_{12}N_2$, appear, accompanied with saprine, which, although isomeric with cadaverine, has very different properties. Up to this point the alkaloids produced are non-toxic in themselves, but are liable to change into highly poisonous bodies, cadaverine readily passing into the very poisonous piperidine, a substance which is closely allied to, and can be obtained from the ordinary pepper alkaloid, piperine. Mydaleine then begins to form, and afterwards mydine ($C_8H_{11}NO$), mydatoxine ($C_6H_{13}NO_2$) and methyl-guanidine are also produced.

Pouchet (*Comptes Rendus*, xciv. 848, c. 220 and 362) and Villiers (*Comptes Rendus*, c. 91) have examined the bodies of patients who have died from cholera, and have isolated an alkaloid of a highly poisonous character, and which when injected into the blood of animals produces well-known choleraic symptoms.

In Typhus bacilla cultivations a very strong and poisonous base, typhotoxine ($C_7H_{17}NO_2$) is found, and tetanus cultivations give tetanine ($C_5H_{11}N$).

Poehl (*Ber. der Deutsch. Chem. Ges.* xvi. 1978-1981) has shown that the epi-

demics caused by unsound bread are preceded by heavy rains and an abundance of the plant ergot (*Claviceps purpurea*). In 1881 the Russian Minister of the Interior instituted a commission to investigate the cause of the ergotismus disease, and the results have shown that the peptic action of the mycelium of the *Claviceps purpurea* converts the albumen of the grain into a peptone, which is readily decomposed into a toxic ptomaine. This body gives tests which might lead the operator to consider morphine as being present, but the absorption power of the two solutions on a ray of light passed through them is very different.

In 1887 an epidemic amongst soldiers in the Punjab was traced to milk, and Firth (*Lancet*, i., 1817, p. 213) found that an alkaloidal body, to which he gives the name *lactotoxine*, was present. The cause of the epidemic was undoubtedly due to putrefaction caused by unwashed vessels. The lactic bacillus also sets up a fermentation in milk, in which the milk sugar, or lactose, is converted into lactic acid. This is the usual souring process in milk. The action is—

$$\underset{\text{Lactose.}}{C_6H_{12}O_6} = 2\underset{\text{Lactic acid.}}{C_3H_6O_3}.$$

If, however, the sour milk is allowed to remain in contact with air it passes into a further putrefaction, in which the *Bacillus amylobacter* converts the lactic acid of the first decomposition into butyric acid, carbonic anhydride and hydrogen. This action is represented thus:—

$$2C_3H_6O_3 = C_4H_7O,\ HO + 2CO_2 + 2H_2$$

The poison produced by the Anthrax bacillus (*B. Anthracis*) has not, so far as I am aware, been isolated; nor has the body produced by *B. subtilis*, the hay bacillus, been obtained. The Anthrax bacillus belongs to the ærobic, or air-requiring class, and it is most likely that its rapid and deadly action is due to the absorption of the oxygen of the blood, and consequent asphyxia of the patient.

The *Bacillus urea* (*Vibrio*) is found in the urine, the urea of which it converts into carbonate of ammonia.

$$CO(NH_2)_2 + 2H_2O = 2(NH_4)CO_3.$$

This bacillus is frequently followed by another organism, which oxidises the ammonia into nitric acid. It is one of the most important of the bacilli. It is the active agent in the oxidation of the organic matters contained in sewage, when such is employed to irrigate land. Unfortunately, the bacillus does not have the power of killing any pathogenic bacteria present, which may therefore again pass into the water.

Urea itself should most probably be classed in the ptomaines, for Gréhant and Quinguand (*Compt. Rendus*, xcix. 383) have found that when injected subcutaneously it gives rise to tetanic spasms similar to those produced by strychnine, and that death rapidly follows. They have also found in the blood of persons who died from Uræmia a proportion of urea equal to from 0·2 to 0·4 per cent. In connection with this research it may be stated that Villiers (*Bull. de la Soc. Chim.* xliii. 550) has shown that alkaloidal bodies are not present in normal or healthy urine, but indisposition is instantly followed by their production. He further suggests, what is evidently most probable, that should these poisonous substances increase to a greater extent than it is possible for the urine to carry them out of the system, they may cause death. This would go far to show the advisability of supplying an abundance of liquids to patients labouring under certain diseases.

The ptomaines readily combine with arsenic, and Husemann (*Archiv. der Pharm.* xix. 415) suggests that as the compounds of the ptomaines with arsenic are volatile, these bodies may have to do with arsenical paper poison-

ing. It is, however, unnecessary to go so far afield in many of the cases of this kind of poisoning, as we know that they frequently follow the event of a dusting of the room, the removal of solid particles from the cornices, etc., to the air, and thence to the lungs, being quite sufficient to account for the case. It might, however, be of interest if those who have the opportunity of seeing such cases would note especially whether the paste which holds the paper to the wall or the glue size are in an active state of putrescence.

Gautier (*Jour. de Pharm.* xiii. 354 and 401) has obtained from fresh muscle a series of alkaloidal bodies, all of which are crystalline, and which when administered to animals cause sleep, and in some cases vomiting and purging, in a manner very similar to the snake poisons. They are less powerful than the ptomaines, and are known as leucomaines.

Xantho-creatinine, $C_5H_{10}N_4O$, is the most abundant of the muscle alkaloids. It occurs in sulphur-yellow spangles, with a bitter taste, and is soluble in water and in hot alcohol.

Cruso-creatinine, $C_5H_8N_4O$, is a strongly alkaline body, and yields soluble crystallisable salts. It resembles creatinine.

Amphi-creatinine, $C_9H_{19}N_7O_4$, is obtainable from muscle in small quantity only.

Pseudo-xanthine, $C_4H_5N_5O$, is found in the mother liquor after the preceding four alkaloids have been removed. It is yellow in colour, and forms soluble salts.

Two other bases, having the composition of $C_{11}H_{24}N_{10}O_3 + C_{12}H_{23}N_{11}O_5$, have also been obtained by Gautier from muscle.

A further research (*Marino-Zuco Gaz. Chim. Ital.* xiii. 431) has shown that it is possible to obtain from fresh animal substances, such as yolk of egg, brain, lung, heart, spleen, liver, and blood, a material which is identical with neurine, and the author considers that he has thus proved that the ptomaines are not due to the sudden splitting up of the proteids, but to the breaking up of the lecithins under the influence of acids or alkalies.

Brieger (*Ber. der Deutsch Chem. Ges.* xvii. 1137), following up this research, has shown that choline is converted into neurine during putrefaction. These two substances, neurine and choline, have very different toxic properties, for whilst a hypodermic injection of 0·04 grain of the chloride of neurine is fatal to a rabbit weighing one kilo (2¼ lbs.), for a similar effect 0·5 grain of choline hydrochloride would be required.

Mytilotoxine, $C_6H_{13}NO_2$, has been isolated by Brieger from poisonous muscle. The presence of these toxic leucomaines in fresh animal substances is interesting, and gives a possible reason for many cases of poisoning.

Bacteria are abundant in water, even when derived from springs. These microbes are, however, not pathogenic. Pathogenic bacteria when introtroduced into spring water do not multiply (Bolton, *Zeitschrift für Hygiene*), but gradually disappear, those which produce resting spores remaining for the longest period. *Bacillus anthracis* spores were still capable of vitality after the lapse of a year. Typhus bacillus was active after a month, but not after ten and a half months. The bacilli in water, however, would seem to produce a change in the substances dissolved in the liquid, for the oxidisable organic matter decreases, whilst there is an increase in the amount of ammonia. After a time the ammonia becomes oxidised into nitrates and nitrites (Leone, *Gaz. Chem. Ital.* xvi., p. 505). During nitrification atmospheric oxygen is necessary. In the presence of carbonic anhydride (CO_2) the bacteria decrease (Sohnke, *Chem. Centr.*, 1886, p. 699), and are not capable of reproduction so long as the gas is present.

In these notes I have tried to lay before you as shortly as possible the

main points contained in the mass of investigations which have been made since Selmi first isolated his ptomain. The field is still open, and the work as great as ever it was. No more interesting subject can be found, and none that will better repay the labour expended. To obtain a substance which will kill the bacteria without proving toxic to the patient may be difficult, for Hatton has shown that many of the forms can live indifferently in an atmosphere of air, oxygen, nitrogen, hydrogen, carbonic oxide, carbonic anhydride, cyanogen, sulphurous anhydride, nitrous oxide, sulphuretted hydrogen, nitric oxide, acetylene, and coal-gas. Some of these gases, indeed, they possess the power of utilising. Carbonic oxide is oxidised into carbonic anhydride—hydrogen and marsh-gas being also produced; cyanogen becomes carbonic anhydride and nitrogen; nitric oxide passes into nitrogen and carbonic anhydride.

Solutions of salicylic acid, strychnine, brucine, morphine, and narcotine do not kill bacteria, but phenol, alcohol, permanganate of potassium, and spongy iron are fatal to the organisms. Probably oxidising substances, if given in weak solution, might prove useful, as, indeed, has already been found to be the case in the application of chlorine water in cases of diphtheritic throat, etc.

Mr. ROBINSON, F.R.C.V.S., in proposing a vote of thanks to the lecturer, said, My Lord, Ladies, and Gentlemen,—I rise to propose a vote of thanks to Professor Macadam for the very interesting lecture which he has just given us; and I am very glad to see such a big crowd here to welcome Professor Williams on this occasion. Between students and friends, really I do not see where another person could be crushed in. (Applause.)

Mr. ELPHICK, M.R.C.V.S., in seconding the vote of thanks, said, My Lord, Ladies, and Gentlemen,—It gives me great pleasure to second this vote of thanks to Professor Macadam for his very able address. I am sure that I am only speaking the sentiments of all present, when I say that we were very much interested in what we have heard, and I must say I have been highly interested, and would not have missed the lecture for a considerable consideration. And as to you students, I would seriously recommend it to your earnest consideration. I have not the slightest hesitation in saying that the lecture we have heard will tend at some future date to elucidate many obscure diseases that we have to contend with, and will guide us in our future treatment and study of surgical diseases. (Applause.)

Professor MACADAM thanked them for the vote of thanks, and said that as the years went on he was always more and more glad to get to work again. The subject which he put before them might lead some, at least, to think that there was a connection between chemistry and disease; that was the intention of the address. (Applause.)

Principal WILLIAMS, in proposing a vote of thanks to the chairman, said, Ladies and Gentlemen,—It affords me extreme pleasure to ask you to join me in giving a vote of thanks to our chairman, Lord Haddington, for the very high honour which he has done me and this institution, and the great privilege we have all had in listening to his remarks here to-day. (Loud applause.) I think you will all agree with me that when his lordship was born to the very high estate which he has inherited, the profession of veterinary surgery lost a very good member. (Applause.) In all his observations to-day you would observe that he has closely followed the progress of our profession. He remembers, as I remember, the peculiar ideas that we had in the old days about the "stirring up" of humours and so forth. I think my memory serves me better, for I remember that the first course of physic was for "stirring up" the humours, the second for "floating" them, and the third for "carrying them off." Many a time and oft do I remember, ladies and gentlemen, that the animal was carried off. (Laughter.) In connection with this

subject, Principal Williams went on to say that he wished to transgress for a little from the main point, and refer to certain alterations which had been made in the law in regard to Pleuro-pneumonia since they last met there. Cattle that were attacked with Pleuro-pneumonia had now to be slaughtered at the public expense. He did not object very much to that, but he regretted exceedingly that before the Government took this very great step they should not have given greater facilities—a further chance—by making a great experiment as to the utility of inoculation in arresting Pleuro-pneumonia. He certainly believed that inoculation would have been a much more economical method of dealing with Pleuro-pneumonia than slaughter. The Government had destroyed the chances of making a great scientific discovery—whether it was really the truth that inoculation would have prevented the spread of the disease. He regretted this very much. He thought that before the Government did this they should have given a chance of making this experiment. What would £10,000 be to the Government of a great country like this? A vote of £10,000 might have been allowed for the experiment, even if it proved a failure, and then slaughter might be brought into force. Slaughter, however, had now come into force, and the experiment was knocked on the head. He also objected to the method of compensation. When cattle had to be slaughtered he maintained that they should be paid for out of the imperial exchequer. It was abominable that the local authority should have to pay for these animals. A case happened last month in which cattle were brought into this city on the Tuesday, and sold in the market to a farmer in the country. One was challenged in the market as being unwell, and either that day or the next died from Pleuro-pneumonia. These cattle had to be slaughtered and paid for by the county of Edinburgh. The day before they were in Glasgow, and a day or two before that they were in Dublin, where they probably contracted the disease; but because the disease was detected in the county of Edinburgh, the county had to pay the whole expense. He said distinctly that the compensation should come from the Government if they be slaughtered for the prevention of the spread of the disease. This tax should come from the public at large, and not from one single district. There was another matter that was getting a great deal of attention, and that was Tuberculosis. It was now conceded on all sides that Tuberculosis was a contagious disease. He had no hesitation in saying it. There was only one "power *that be*" that seemed to doubt it, and from a leading article the other day in a veterinary paper, it seemed that that power was the head of the Privy Council in London. But there was no doubt about it; it was proved by scientific experiment. If an animal was inoculated with the bacillus the disease was brought on; and if human beings were inoculated by it—as they often were, by milk from cows—it brought on Consumption, that dreadful malady which carried away the fairest and brightest in this country. It was quite right that all animals suffering from Tuberculosis should be slaughtered and their carcases destroyed. But who was to pay? The Government did not recognise it as a contagious disease. A cow suffering from Tuberculosis was sent to the slaughter-house, killed, and examined. The carcase was condemned, and the owner was taken to the court and fined. He lost his cow and paid a fine, although he might have been unconscious of the existence of the disease. Let Tuberculosis be under the Contagious Diseases (Animals) Act, and let them endeavour to eradicate it. The man who could discover anything that would destroy the bacillus would be one of the greatest benefactors to the human race that ever lived, and would be adequately rewarded. Let them put their shoulders to the wheel and eradicate this disease. Men who were put at the head of the slaughter-houses should be scientists, men who could use the microscope and determine whether or not an animal was affected with Tuberculosis. He

could order its destruction, and save men from being taken to court and fined £20 by a bailie. (Laughter and applause.)

Mr. BRIGGS, F.R.C.V.S., in seconding the vote of thanks, remarked that it would not have been an easy matter to get a chairman so admirably qualified as his lordship, and he thought that so long as Professor Williams and that institution were supported by the ability of such gentlemen their profession would succeed. Professor Williams was an old friend of his, whom he knew before he became Professor, and he was certain that throughout the land there was no man more popular in his profession. (Applause.)

The CHAIRMAN, in returning thanks, said, Ladies and Gentlemen,—I beg to return my sincere thanks for the kind reception given me, and the kind way in which you have received the vote of thanks which has been given to me for my imperfect services here to-day. My remarks must be brief, and I will simply say that I concur with what has fallen from the Principal in regard to Pleuro-pneumonia, and the hardship entailed by paying compensation which, I also think, ought to come from the imperial purse. I will take the first opportunity of bringing the subject home in the proper quarter. (Applause.) I wish all success to the New Veterinary College, and hope this session may be an important and successful one; and I also wish every success to the students of this college, and hope that with their industry, efforts, and knowledge of the veterinary art they may become benefactors of mankind by assisting them in the recovery from suffering of animals of all kinds. (Loud applause.)

DICK'S VETERINARY COLLEGE.

THE sixty-sixth session of the Royal (Dick's) Veterinary College was opened on October 3rd, by the delivery of an address by Principal Walley, in the large lecture-room of the college, Clyde-street, Edinburgh. Bailie Turnbull, who occupied the chair, said that last session had been most successful. The success of the students at examination for the College diploma of the Royal College of Veterinary Surgeons seemed to have been most excellent. During the past year the Fitzwygram first and second prize of £50 and £30 had been gained by two students of this college, who not only took a high place in the class competition, but were also the only students who passed the examination with honours. At the competitive examination for the Army the students of that college had taken a distinguished place. Principal Walley, who was received with cheers, said that he proposed to consider the advancement made in their profession from a medical and surgical point of view since last they met. At present there were few potent drugs in the sister profession that were not equally used in their own, and in spite of difficulties they had to contend with, they were as successful as the members of the more favoured sister branch, and were as successful in their diagnosis, notwithstanding the fact that they had no means of getting help from their patients. Principal Walley then alluded to the disease of Roaring in horses, saying that the method of tracheotomy would in the long-run prove to be the best. He regretted the action taken by some members of the medical profession in reference to the transmittibility of Scarlet Fever by the cow. As a veterinary surgeon, he positively affirmed that there was no disease met with in the cow that bore the slightest analogy to the Scarlet Fever of the human subject. Speaking of Pleuro-pneumonia disease, he said that if all the centres of disease were effectually destroyed the disease must cease to have existence. In regard to inoculation, his conviction as to its inutility had not been shaken, nor his views altered, by the inquiries carried out by the Departmental Committee. If the recommendations of the Committee on Tuberculosis were adopted they would be of untold benefit to the raiser, importer, and consumer of stock. A vote of thanks to the lecturer, on the motion of Bailie Cranston, terminated the proceedings.

CENTRAL VETERINARY MEDICAL SOCIETY.

THE eighteenth annual general meeting of the above Society was held on the 4th inst., at the First Avenue Hotel. In the unavoidable absence of the President (Mr. Charles Sheather), Mr. Wragg, Vice-President, occupied the chair.

The following gentlemen were present: Professors Axe and Pritchard, Messrs. Broad, H. D. Gibbings, A. Gostling, W. S. Harrison, W. Hunting, T. Moore, W. J. Mulvey, F. T. Oatway, W. S. Reid, Irwin Roberts, J. Rowe, William Roots, H. G. Rogers, Frederick Smith, W. F. Shaw, J. Woodger, and the Secretary.

Letters of apology for non-attendance were received from Professor Walley and Mr. H. Edgar.

The CHAIRMAN said the first matter for their consideration was the question of electing Mr. William Hunting as an Honorary Fellow of the Society. At a meeting of the Council held on 5th July last it was unanimously resolved to ask the Society to confer this honour on him, in recognition of his good services during several years.

Professor AXE said Mr. Hunting had rendered signal service to the Society, and he thought, having regard to the fact that he had held the office of Secretary, and that that office was purely a voluntary one, unattended by any remuneration, the least they could do was to recognise his labours on their behalf by conferring on him the distinction which the Council had suggested. He had therefore great pleasure in proposing that Mr. Hunting be made an Honorary Fellow of the Society.

Mr. ROWE said it afforded him very great pleasure to second the proposition. Mr. Hunting was a gentleman who deserved well at their hands, quite apart from his position as a member of the Society.

Mr. Hunting was then by ballot unanimously elected an Honorary Fellow.

Mr. W. C. B. Dickenson, F.R.C.V.S., of Boston, Lincolnshire, and Mr. A. Gostling, M.R.C.V.S., of Regent's Park Road, London, were elected Fellows of the Society.

Mr. W. S. Reid, M.R.C.V.S., was nominated for Fellowship.

The SECRETARY read the balance-sheet for the past year, which showed the Society to be in a good financial position. Messrs. Roots and H. G. Rogers were auditors of the accounts. After some discussion, the balance-sheet was adopted, on the motion of Professor AXE, seconded by Professor PRITCHARD.

The election of officers for the session 1888-89 was then proceeded with, and—

Professor PRITCHARD said he wished to propose for the office of President Mr. Alfred Broad. It was well known to all of them what good service he (Mr. Broad) had rendered to the Society. He had acted as Honorary Secretary for seven years, and there was no doubt he would make an efficient President.

Mr. WILLIAM ROOTS had great pleasure in seconding Professor Pritchard's proposition.

The following officers were then elected by ballot:—

President—Mr. Alfred Broad, F.R.C.V.S.

Vice-Presidents—Professors Axe and Pritchard; Messrs. T. Moore and F. Wragg.

Members of the Council—Messrs. H. D. Gibbings, A. Gostling, W. Hunting, W. S. Harrison, W. T. Mulvey, F. Oatway, F. Raymond, W. Roots, J. Rowe, F. G. Samson, C. Sheather, and F. Smith.

Mr. Joseph Woodger was re-elected Honorary Treasurer; Messrs. Roots

and Rogers were elected Auditors; and the Honorary Secretary was also re-elected.

It was announced that the annual dinner would take place on the 1st of November next, at 7 p.m.

A vote of thanks to Mr. Wragg for occupying the chair brought the proceedings to a close.

SIDNEY VILLAR, *Hon. Sec.*

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above Association was held at the Blackfriars Hotel, Manchester, on Sept. 12th.

Present: J. B. Wolstenholme (president); Dr. Fleming, C.B.; W. Hunting, London; Messrs. Peter and W. A. Taylor, Thos. Greaves, W. Dacre; John Moore, T. Hopkins, Sam. Locke, E. Day, A.V.D., all of Manchester; Messrs. Wm. Whittle and Arthur New, Worsley; Wm. Woods, sen., Wigan; R. C. Edwards, Chester; J. G. Mayor, Kirkham; Jas. Hart, Oldham; Thomas Briggs, Bury; H. Cooper, Huddersfield; F. Whittaker, Farnworth; Thos. Dolie, Birkenhead; Jas. Marshall, Knutsford; J. R. Charlton, Wexford; R. C. Reynolds, Geo. Morgan, and the Secretary, Liverpool.

Letters of apology, regretting their inability to attend, were received from upwards of twenty members and friends.

The President nominated Mr. R. Hughes, M.R.C.V.S., for membership of the Association.

Proposed by Mr. W. A. TAYLOR, seconded by Mr. WHITTLE, that the amended rules be adopted.—Carried unanimously.

Dr. FLEMING then opened the adjourned discussion on Roaring. He discoursed at length his views and opinion of the affection, and in an able manner gave detail and statistics in connection with the new laryngeal operation. He also delivered some very interesting remarks concerning the Duke of Westminster's Ormond.

Mr. GREAVES debated at some length, being followed by Messrs. Hopkins, Peter Taylor, R. C. Reynolds, W. Dacre, J. G. Mayor, W. A. Taylor, Thos. Briggs, the Secretary, and others.

At the conclusion a very cordial vote of thanks was voted to Dr. Fleming, and which was carried with acclamation.

The usual vote of thanks to the President concluded the meeting.

ARTHUR LEATHER, *Hon. Sec.*

ROYAL SCOTTISH VETERINARY SOCIETY.

THE quarterly meeting of the above society was held on October 3rd, in Dick's (Royal) Veterinary College Buildings, Clyde-street, Edinburgh. Principal Walley presided over a fair attendance, and after the routine business had been conducted a discussion was raised on the report of the Departmental Committee appointed to inquire into Pleuro-pneumonia and Tuberculosis in the United Kingdom. The chairman said that as far as he was personally concerned he was more than pleased with the report. There was one statement, however, dealing with Tuberculosis which he thought was a slur on their profession, namely, that there would be no difficulty in diagnosing cases of Tuberculosis. Mr. Campbell, Kirkcudbright, also expressed himself highly satisfied with the report. In connection with the inspection of meat, he thought that, as a general rule, new members of the profession had a good knowledge of morbid anatomy. Instead of medical men being appointed inspectors of meat markets, they should ask the advice of junior veterinary surgeons. Mr. Pottie, Paisley, referred to the "compensation clause" as satisfactory. Mr. Campbell moved that the discussion be adjourned till next quarterly meeting, when possibly a recommendation to the Government could

be drawn up. This was unanimously agreed to. It was agreed to change the date of the annual meeting of the society from September to October. This was all the business of importance.

LINCOLNSHIRE VETERINARY MEDICAL SOCIETY.

THE next meeting will be held at Huntingdon, on Thursday, November 22nd, when Professor J. W. Axe, of the Royal Veterinary College, will deliver a lecture on "Lessons in Laryngotomy and Laryngo-tracheotomy, as applied to Roaring," and also exhibit specimens showing the reparative process following the operation.

Members of the profession are cordially invited to be present.

THE CALCUTTA VETERINARY ASSOCIATION.

IT says much indeed for the robustness and zeal of our colleagues in Calcutta, that they have summoned courage to establish an association "for the interchange of ideas, and the discussion of subjects connected with veterinary science;" which shall also "invite medical men, and gentlemen interested in sport and subjects connected with veterinary science, to become Honorary Members."

There is ample work and material for such a society, and it should be productive of much benefit to its members, and help to disseminate interesting and important information to the entire profession.

The organisation of the Association augurs well for its future. Though it can only at present boast twelve or thirteen members, yet these are well known for their energy and scientific ability. We learn that at a meeting held at Calcutta on September 6th, Mr. Greenhill was elected President, Mr. Spooner-Hart Vice-President, and Mr. T. Assheton Smith, Honorary Secretary and Treasurer. A working Committee was also appointed, consisting of the President, Vice-President, R. A. Turnbull, S. T. D. Symons, and the Honorary Secretary.

This, the latest addition to our veterinary societies, has our very best wishes for its prosperity, and any assistance we can afford it will be gladly given.

CENTRAL VETERINARY SOCIETY OF FRANCE.

THE French Minister of Agriculture has just bestowed the annual subvention of 5,000 francs (£200) from the large grant made by the Government for the encouragement of agriculture, to the Central Society of Veterinary Medicine, for its maintenance. This Society every year devotes 2,000 francs (£80) for the purpose of awarding prizes to those members of the veterinary profession in France who contribute the best works on subjects connected with veterinary matters (Pathology, Hygiene, Therapeutics, etc.), the decision as to the merits of these being left to a Commission appointed by the Society. The prizes are in the shape of gold, silver, and bronze medals, and their distribution has been made within the last few days to a large number of competitors.

Obituary.

The following deaths of members have been reported during the month:—

L. McKirby, Rothesay, Bute	Graduated	1873
R. Hopkins, Pontypridd, Glamorganshire ..	,,	1867
T. H. Prior, Dublin	,,	1879
J. Johnson, Penicuick, Midlothian	,,	1842
S. Revill, Ilkeston, Derbyshire	,,	1857

Army Veterinary Department.

Gazette, October 2nd.

The under-mentioned Veterinary Surgeons to be Veterinary Surgeons First Class, dated 5th October:

Richard H. Ringe, Robert Pringle.

Veterinary Surgeon Gerald H. Fenton to be retired, receiving a gratuity. Dated 5th October.

Gazette, October 9th.

Veterinary Surgeon William R. Hagger to be Veterinary Surgeon First Class, dated 13th July.

Robert J. D. Tibaldi, gent., to be Veterinary Surgeon on probation, dated 10th October.

Veterinary Surgeon First Class W. Gladstone has embarked for a tour of service in India. Veterinary Surgeon First Class J. A. Nunn has returned to England from his special mission to South Africa. Professor Steel has been allowed an extension of sick leave, and admitted as a patient to the Military Hospital, Netley.

It has been decided that Veterinary Surgeons attached to the Remount Department shall retain their appointments for five years, their names being removed from the roster of Foreign Service during that period.

The *Lahore Gazette*, alluding to the most recent military expedition in India, remarks: "In our issue of the 17th, we stated that, so far as we were aware, no arrangements for the veterinary care of the animals accompanying the Black Mountain Expedition had been made. We learn now that Veterinary Surgeon First Class Ewing, has been detailed to take charge. If one veterinary officer is sufficient to take care of some four thousand animals, surely the number of medical officers ordered up must be superabundant, when we consider the infinitely harder usage that falls to the lot of the four-footed campaigner? If the Indian tax-payer had any voice in these matters he would assuredly want to know why, if one veterinary officer is sufficient to look after six lakhs of rupees' worth of animals—for which he has to pay—about 36 medical officers are despatched to attend to the medical wants of the men, who, as far as native troops are concerned, can be replaced at less expense. From a purely humanitarian point of view, an agent of the P.C.A. Society might still advantageously accompany the expedition."

Notes and News.

Transmission of Actinomycosis from Man to Man.—Dr. R. Baracz, of Lemberg, in a recent number of the *Przeglad Lekarski*, reports two cases of Actinomycosis in man. In the first a small painful swelling over the left lower jaw developed after the extraction of a tooth. The tumour which was of the size of a walnut, showed distinct fluctuation over some parts, and could be moved on the bone. Its margins were solid. The skin over the swelling was red, and hotter than natural. The patient could open his mouth only slightly and with pain. The unusual appearance of the tumour, its slow growth, and the fact that the patient was a cabdriver, caused Actinomycosis to be suspected. The man, however, did not sleep in the stable, and he had not been in contact with any animals but his own, which were healthy; he used, however, to buy the hay for his horses himself. Dr. Baracz incised the

tumour at two spots where there was distinct fluctuation, with the view of performing a radical operation if the microscopic examination of the contents of the abscess confirmed the diagnosis of Actinomycosis. The cavity was washed out with a five per cent. solution of carbolic acid, and an iodoform dressing was applied. The microscopic examination proved that the suspicions were correct, but as the patient had a fainting fit during the opening of the abscess, he would not consent to any further operation. The wound healed in a couple of weeks, and no trace of the swelling remained; the patient felt quite well. In the second case the patient was a woman, aged twenty-three, who was betrothed to the cabdriver whose case has just been described. She had an abscess of the size of a walnut on the alveolar process of the left lower jaw. The abscess was opened, and half a coffee-spoonful of pus discharged from it; an antiseptic dressing was applied. Microscopic examination revealed the presence of Actinomycosis. The wound healed in a short time, and only a solid prominence remained behind over the spot. A second small abscess formed later on on the alveolar process of the left upper jaw, which burst spontaneously and soon healed. Though the etiology was not quite free from uncertainty in the first case, there could be no doubt as to the transmission of the disease from the man to the woman.

Poisoning of Horses by Ranunculus Arvensis.—The poisoning of horses belonging to Mr. William Gray, farmer, Gamlingay, and some valuable cattle through eating some wild plant, has been further investigated. Just prior to the death of the horses they had been eating tares, and among these tares was a quantity of another deadly poisonous plant, namely, the arable land crowfoot (*Ranunculus arvensis*), locally known as "beggar's lice." There are well-established records of cattle being killed by this plant, with all the appearances in the stomach that were presented in the cases of the horses.

Cake and Pudding Affection in Animals.—The *Illustrated Sporting and Dramatic News* has the following:—"A correspondent kindly sends me a story from Christchurch, New Zealand—English horses have not these quaint tastes—and here it is. In a stable in this city there is a horse entertaining a most cake and pudding affection for a hen. The hen has an equally strong and equally strange affection for the horse. Only in the horse's manger will the hen lay, and the horse waits with more or less patience until the egg has been 'shed.' He then, with a most unnatural appetite for an equine, quietly swallows the egg, and does so with the greatest gusto imaginable. The hen will lay nowhere else but in this particular manger, and when 'Chuckie' is taking, to the horse's thinking, too long a time to deposit the coveted morsel, the horse opens his soft lips, lifts the hen by the tail to see if the egg has been laid, and, if it is, quietly appropriates the delicate morsel. If it is not, he becomes quite restless until the little delicacy he has been waiting for is 'passed,' but he will have the egg, and his fondness for the hen who thus supplies him is unbounded. The story appears incredible, but the horse's owner is perfectly willing to convince anyone to the contrary."

Canine Suicide.—The latest case of canine suicide is reported in a new Indian paper, *The Argus*, from Calcutta. An engine with cars attached, was seen coming down the line, when a pariah dog was seen to cross the road towards the approaching cars, and deliberately lie down on the line just in front of the engine. The "cow-catcher" failed to remove the animal, which was cut in two by the wheels of the cars.

Bird Instinct.—It is reported that in Peru and other parts of South America, this year's fruit has been avoided by birds, while it has caused the death of cattle and sheep, when fed on it in large quantities. These obser-

vations have been cited as tending to show that the instinct of birds with respect to the wholesomeness of fruits is frequently a worthy guide for human beings to follow. The possibility is suggested that the variation in the fruit of different years may have something to do with outbreaks of Cholera.

STRAY AND RABID DOGS IN LONDON.—From official statistics issued recently, it appears that during September, 1021 stray dogs were seized in the Metropolis by the police; twenty-four of the animals were killed in the streets, "as mad or ferocious," nineteen by the police, and five by private persons. During the above period seven police officers and ninety-six civilians were bitten by dogs not suspected of being mad, and one individual by a dog certified to be suffering from rabies. The 1021 dogs were all taken to the Home at Battersea.

PROTRACTED INCUBATION OF RABIES.—The *Sémaine Médicale* reports that a man named Sinardet, aged twenty-six years, bitten by a rabid dog on April 26, 1886, and treated at the Pasteur Institute from May 3rd to the 12th, 1886, died of Convulsive Rabies at the hospital of Bourg on July 28th, 1888, twenty-seven months after the anti-rabic treatment.

DISHORNING OF STOCK.—The Tennessee Agricultural Experimental Station has issued a report on the subject of dishorning cattle. The conclusions to which the experimentalists have come are that—(1) For removing the horns, an ordinary meat-saw is perfectly satisfactory. (2) The horns should be removed as close to the head as possible, without cutting the skull proper. The sawing should be done rapidly, and with long sweeps of the arm if possible. (3) Animals one and two years of age appear to suffer considerably in dishorning. The painful effects decrease with increase of age, so that an animal of ten years old may suffer but very little. This is owing to the layer of flesh surrounding the base of the horn, which is much thicker in young than in old animals. Dishorning causes an abnormal increase of pulsation and temperature, which extends over several days. The appetite is also affected during the twenty-four hours succeeding the operation. (4) Dishorning is more especially to be recommended for those animals that are of vicious temperament, that are what are termed "masters;" to be applied to bulls, and to beef animals that are to be kept quiet and closely stabled or shipped. (5) From evidence quoted from other sources, it appears that dishorning is not necessarily a cruel practice, but may be conducted to promote ends that are both humane and desirable in live-stock breeding. Mr. Sadler, British Consul at Chicago, reports that in his very extensive district the system of dishorning or dehorning cattle is rapidly increasing. Some farmers have dehorned their whole herd. It has been calculated that 200,000 cattle and horses die each year in the United States from horn-thrusts. The advocates of the system of dehorning claim that, besides lessening this loss and that of human life, much shed-room is saved, less hay is consumed, there is less turmoil from restive animals, and that cows, being more quiet and docile, give more milk. In the case of calves the horn is extracted by a gouge or punch when two or three months old, and with full-grown animals the horn is sawn off at the point where the matrix joins the bone horn, and should be done early in the spring. If sawn higher up the horn grows again; if below, the process of granulation would not take place.

HOG CHOLERA IN THE UNITED STATES.—Mr. Hayes Sadler, British Consul at Chicago, in a recent report on the agriculture of his district, which includes all the States and territories west of Illinois and Lake Michigan to the Rocky Mountains, refers to hog breeding and disease. He says that there has been sufficient admixture of high-class breeds to bring the swine up to a high standard, and to leave little to be desired in the form and quality of those

brought to the packing-houses. But simultaneously with this improvement in grade various diseases have developed themselves. Formerly the ugly-shaped native hogs roamed in a half-wild state and found their own living; now they are bred in an artificial manner, kept and fed in pens, and possibly this indolent and civilised existence may be one cause of the increased disorders to which they are now liable. No definite decision as to the nature of the Hog Cholera and other diseases, or as to the remedies for them, has yet been reached, notwithstanding much investigation. Meanwhile the losses are enormous, entire herds of hogs being carried off in a week by disease arising from no known cause, with no known means of checking the disaster. It is said that the dead animals are occasionally sold, and even enter into the composition of lard, butterine, or soap; but Mr. Sadler thinks it is scarcely possible to credit these statements without substantial proof, in the face of the inspection which exists at the stock-yards. There is no general law for the disposal of hogs which have died of disease, and in fact the laws of Iowa provide that they may be turned into lard and sold if the latter is marked "Lard from hogs which have died of disease."

Correspondence.

THE LATE PROFESSOR ROBERTSON.

DEAR SIR,—Would you kindly allow me space to inquire as to the present position of the Robertson Memorial Fund? Your readers may remember that eight months since an appeal was made to students and members of the veterinary profession. This appeal, characterised by much temporary energy, had for its object the purchase of a memorial bust. For six months there has been no evidence of vitality in the matter, or any movement to give publicity as to the amount at the disposal of the executive. Are we to regard this inactivity as a deplorable sign of the degenerate age in which we live? or are the subscribers to remain in a hope that they will soon be invited to witness the unveiling of the artist's work? I can hardly conceive how men can so soon forget, and allow to pass unmarked and forgotten, the masterly energy and kindly interest ever displayed by our late Principal and friend. Professor Robertson started a great work in our Veterinary Medical Association; why should not that society, which owes him so much, now come forward, and if the money cannot be obtained otherwise, make up the deficiency out of the large surplus now at their disposal, rather than let the memory of a man whose life of energy shows such an example for us to follow fall to the ground (for we have shown how soon we can forget)?

Royal Veterinary College, *October 18th.* J. HAROLD BOOTH.

ANATOMY AND PHYSIOLOGY.

SIR,—In reading the proceedings of the Midland Counties Veterinary Association, as reported in the Journal for this month, I find myself much bothered as to my notions with regard to the anatomy and physiology of the horse's larynx. One speaker said the vocal cord had nothing to do with Roaring, and that removal of the arytenoid cartilage would render a horse liable to choke; another speaker considered the vocal cord composed of *white* fibrous tissue; while another speaker said he had *removed both vocal cords*, "and rendered my unfortunate animal dumb"! What was this unlucky animal? Was it a talking one, like Balaam's ass, before being deprived of both its vocal cords? And what was the object of the

operator? The previous speaker had mentioned that it was upon the control of the muscles over the chordæ vocales that our great singers are enabled to produce high and low notes; and the excisor of the voice-producing bands agreed with that statement, and gave his own experience as to the unhappy effect of their removal. Was the unfortunate animal a "musical" one, in the horse-coper's sense of the term? If so, then the operation appears to have been eminently successful, and the operator should be congratulated on having succeeded in producing dumbness. But the other anatomical and physiological references rather disturb my working notions on these subjects. Can you or any of your readers put me on the clear track again?

October 20th. CRUX.

A QUESTION OF PLUMES.

MR. EDITOR,—In one of the busy and fashionable streets to the west of Regent Street, London, parallel with, and not many hundred yards from it, an M.R.C.V.S. has on his sign-board above the entrance to his establishment, in addition to name, "Veterinary Surgeon to H.R.H. the Prince of Wales," and, of course, the Prince of Wales's plumes. Now, sir, I wish to know what entitles members of a profession to use this designation and suspend the plumes. I am aware that tradesmen who supply the Prince with commodities, and persons who perform certain duties for his establishments, even down to the chimney-sweeps, are, if actually appointed, privileged to announce as above. But I have never heard of the professional men whom His Royal Highness employs so designating themselves, on signboards at least. Of course we can understand a farrier doing such a thing, for he is a tradesman and artisan; but an M.R.C.V.S. should consider himself something higher than a tradesman, and therefore above adopting tradesmen's artifices to draw business.

Again, sir, can you inform me if any penalties attach to borrowing the designation and the feathers without permission, or without being at the time a royal tradesman? STERLING METAL.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from G. T. Pickering, York; S. R. Howard, Ohio, U.S.A.; J. H. Steel, A.V.D., Bombay; T. Assheton Smith, Calcutta; A. J. Haslam, Karachi; Professor Müller, Berlin; J. H. B. Hallen, Simla; H. Gray, London; R. W. Burke, A.V.D., India; G. R. Griffith, A.V.D., Cairo; A. Leather, Liverpool; J. Brodie Gresswell, Louth; Sidney Villars, Harrow; A. W. Hill, Esq., London; J. H. Booth, London; C. Hartley, Lincoln; "Sterling Metal"; "Crux."

BOOKS AND PAMPHLETS: *Prof. Müller*, Bericht über de Königliche thierärztliche Hochschule in Berlin, 1887-8; *Dr. N. Lanzillotti Buonsanti*, Tratattato di Tecnica e Terapeutica Chirurgica, etc.; Degli Animali Domestici; *W. Collier, M.A., M.D.*, Hydrophobia: a Review of Pasteur's Work; Bericht über Thierärztlicher Verein von Elsass-Lothringen; "Thormanby," The Horse and His Rider.

JOURNALS, ETC.: *Cincinnati Lancet; Clinic; Lancet; Revue Vétérinaire; British Medical Journal; Recueil de Méd. Vétérinaire; Hufschmied; Clinica Veterinaria; Echo Vétérinaire; Wochenschrift für Thierheilkunde und Viehzucht; Annales de Méd. Vétérinaire; Edinburgh Medical Journal; American Live Stock Journal; London Medical Record; Medical Press and Circular; Giornale di Veterinaria; Journal de Médecine Vétérinaire et de Zootechnie; Journal of National Agricultura Society of Victoria; Veterinary Record; Live Stock Journal; Thierarzt.*

NEWSPAPERS: *Lahore Civil and Military Gazette; Ross Gazette; Gazette de Popolo; Edinburgh Evening News; Scotsman; Dublin Evening Telegraph; Pioneer*